



This is a digital copy of a book that was preserved for generations on library shelves before it was carefully scanned by Google as part of a project to make the world's books discoverable online.

It has survived long enough for the copyright to expire and the book to enter the public domain. A public domain book is one that was never subject to copyright or whose legal copyright term has expired. Whether a book is in the public domain may vary country to country. Public domain books are our gateways to the past, representing a wealth of history, culture and knowledge that's often difficult to discover.

Marks, notations and other marginalia present in the original volume will appear in this file - a reminder of this book's long journey from the publisher to a library and finally to you.

### Usage guidelines

Google is proud to partner with libraries to digitize public domain materials and make them widely accessible. Public domain books belong to the public and we are merely their custodians. Nevertheless, this work is expensive, so in order to keep providing this resource, we have taken steps to prevent abuse by commercial parties, including placing technical restrictions on automated querying.

We also ask that you:

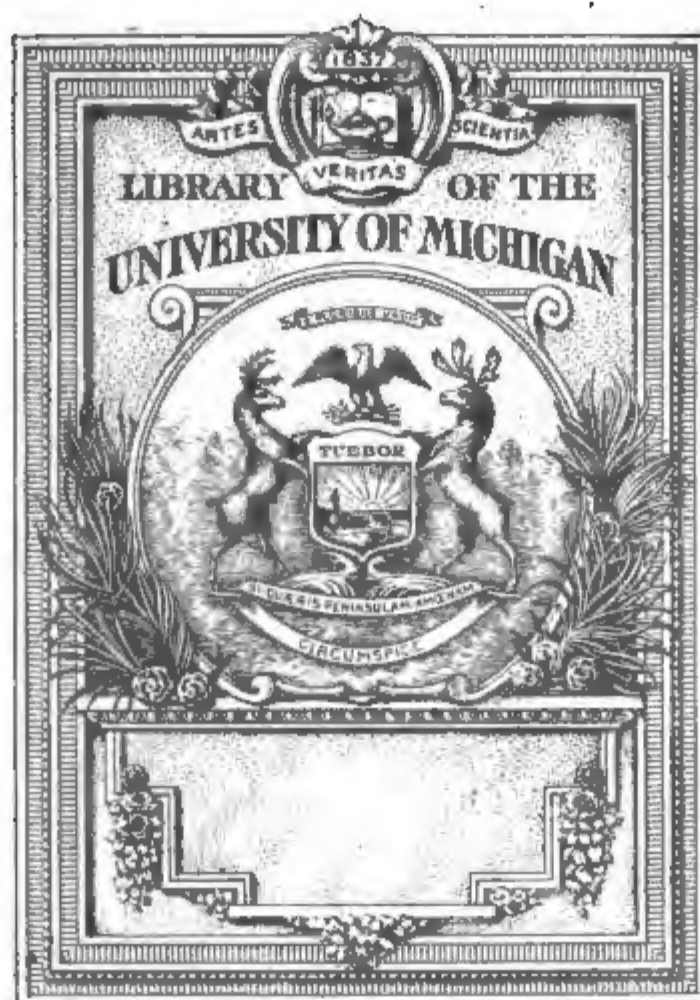
- + *Make non-commercial use of the files* We designed Google Book Search for use by individuals, and we request that you use these files for personal, non-commercial purposes.
- + *Refrain from automated querying* Do not send automated queries of any sort to Google's system: If you are conducting research on machine translation, optical character recognition or other areas where access to a large amount of text is helpful, please contact us. We encourage the use of public domain materials for these purposes and may be able to help.
- + *Maintain attribution* The Google "watermark" you see on each file is essential for informing people about this project and helping them find additional materials through Google Book Search. Please do not remove it.
- + *Keep it legal* Whatever your use, remember that you are responsible for ensuring that what you are doing is legal. Do not assume that just because we believe a book is in the public domain for users in the United States, that the work is also in the public domain for users in other countries. Whether a book is still in copyright varies from country to country, and we can't offer guidance on whether any specific use of any specific book is allowed. Please do not assume that a book's appearance in Google Book Search means it can be used in any manner anywhere in the world. Copyright infringement liability can be quite severe.

### About Google Book Search

Google's mission is to organize the world's information and to make it universally accessible and useful. Google Book Search helps readers discover the world's books while helping authors and publishers reach new audiences. You can search through the full text of this book on the web at <http://books.google.com/>

**A** 437632





LA  
248  
.D4  
A3







# REPORT OF THE SCHOOL SURVEY

of

School District Number One

In the City and County of

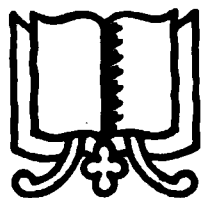
**DENVER**

Part I.

**GENERAL ORGANIZATION AND MANAGEMENT**

BY FRANKLIN BOBBITT, Ph.D.

University of Chicago



*Denver, Colorado*  
=

**The School Survey Committee**

**Denver, Colorado**

**1916**



# REPORTS OF THE SURVEY

The report of the survey of the Denver situation is presented in five sections:

Part I. General Organization and Management.  
By Franklin Bobbitt. 25c.

Part II. The Work of the Schools. 25c.  
Elementary Schools. By Franklin Bobbitt.  
High Schools. By Charles H. Judd.

Part III. The Industrial Survey.  
By C. A. Prosser. 25c.

Part IV. The Business Management.  
By F. S. Staley. 15c.

Part V. The Building Situation and Medical Inspection.  
By Lewis M. Terman. 15c.

Copies of these reports may be had postpaid at the price named upon application to The School Survey Committee, 402 Kittredge Bldg., Denver, Colorado.

CARLOS M. COLE,  
R. E. WRIGHT,  
Survey Committee.

1919

**REPORT OF THE**  
**SCHOOL SURVEY**

of

**School District Number One**

In the City and County of

**DENVER**

**Part I.**

**GENERAL ORGANIZATION AND MANAGEMENT**

**BY FRANKLIN BOBBITT, Ph.D.**

University of Chicago



**The School Survey Committee**

**Denver, Colorado**

**1916**



# Table of Contents

1. THE ONE ISSUE.....	5
2. THE GENERAL SITUATION.....	8
Legislative Powers of the Board.....	8
Administrative Powers of the Board.....	10
Inspectorial Powers of the Board.....	11
Origin of the Situation.....	12
Definition of Major Functions.....	13
Legislative Difficulties .....	14
Inspectorial Difficulties .....	15
Complementary Legislation .....	16
The Board of Directors.....	17
3. LEGISLATIVE FUNCTIONS.....	20
Kinds of Work to be Done.....	20
Character of Work.....	25
The Budget .....	28
Other Fields of Legislation.....	28
Legislative Responsibilities of Professional People.....	29
What Teachers Can Do.....	30
Board's Legislation Must be General.....	32
Legislative Library .....	34
4. ADMINISTRATIVE FUNCTIONS .....	35
Denver's Excellent Organization.....	36
Weaknesses in the Work.....	37
Elimination of Weaknesses.....	38
Need of Permanence.....	40
Principals Need Assistants.....	40
Need of Assistant Superintendents.....	42
Assistant Superintendent in Charge of Business Affairs..	44
Placement of Certain Departments.....	45
The Placement of Functions.....	47
Appointment, Assignment and Tenure.....	47
Examination and Certification.....	49
Retirement Provisions .....	50
Tenure of Superintendent.....	50
Officials Not Under Superintendent.....	51
Need of an Administration Building.....	51

*Handwritten:* 3-7-198  
*Handwritten:* Re-classed 5-25-82  
*Handwritten:* 5-25-82

## TABLE OF CONTENTS—Continued

---

5.	INSPECTORIAL FUNCTIONS .....	53
	Inspection of Finance.....	53
	Inspection of Fuel Costs .....	55
	Inspection of High School Instruction Costs.....	57
	Inspection cost of General Supplies .....	59
	Inspection Cost of General Repairs .....	61
	Inspection Cost of Repairs—Heating and Plumbing....	63
	Inspection of Instruction .....	64
	Inspection of Failures .....	69
	Inspection of Special Promotions .....	71
	Inspection of Attendance .....	73
	Inspection of Progress of Children.....	76
	Inspection of Per Cent of Graduates.....	81
	Inspection of Results of Instruction.....	83
	Inspection of Instruction Costs .....	86
	Inspection of Cost of Text Books.....	88
	Inspection of Cost of Instruction Supplies.....	90
	A Caution .....	92
	Preparation of Facts for Inspectorial Purposes.....	93
	The Board's Use of Inspectorial Facts.....	94
	Antecedent Inspection .....	95
	Subsequent Inspection .....	98
	Community Inspection of Board's Labors.....	99
6.	REPLIES TO OBJECTIONS MADE TO PRELIMINARY RECOMMENDATIONS .....	105
7.	COMPARATIVE SUMMARY OF THE PRINCIPLES OF GOOD MANAGEMENT .....	111

## THE ONE ISSUE

**“More priceless than our mountains, our climate, the gold of our hills, the wealth of our fields, are our men.”**

A civic leader of Denver in an address before the Denver Civic and Commercial Association.

Denver has 50,000 growing men and women of school age.

Though young now and uninvested with authority, within a few years these 50,000 youth will be bearing the chief share of responsibility within the city. From their ranks will come the judges, the journalists, the commercial and industrial leaders, the rank and file of industry and commerce, the legislators, the bankers, and all the others involved in the labors of upbuilding and maintaining an aggressively successful city.

The continued prosperity of Denver depends not only upon proper railroad rates, the attraction to the city of industries, good roads, mountain parks, a commerce that reaches all the hinterland, and the countless other elements of material progress. It depends just as much upon the presence within the city of broadly trained men capable of bearing every responsibility and of ceaselessly overcoming every obstacle to progress, to prosperity, and to an ever-continuing civic and social welfare.

To these bearers of the city's burdens, as they now prepare for their labors, Denver wishes to give the most virile and the most profitable training possible. Only the best is good enough.

Denver wants to know with assurance that the best possible conditions of training are provided.

The city wants the work done without waste. It wants efficiency with economy.

The test of every constructive proposal made in these reports of the survey, or made elsewhere, should be: **Is the recommendation made for the purpose of improving directly or indirectly the quality of the training to be given to the growing men and women of the city?** A recommendation that will not stand this test should be accorded no consideration.

A second question that should always be asked those who are making these forward-looking proposals is: **Just how does the proposal promise increased effectiveness in the work of the classrooms?** If it cannot be shown to an impartial jury that the proposal promises to improve the training, then it is not a matter of any constructive import-



ance. Any proposal made here or elsewhere, however, that will stand both tests, it would seem the city could scarcely afford not to consider.

The test of every opposition to constructive proposals should be: **Is the opposition for the conscious purpose of improving the training that goes on within the class-rooms of the city?** Along with this belongs a second question: **Just how, in detail, do the counter-proposals intend to secure increased effectiveness in the training?**

If it can be proved in terms of class-room work that the counter-proposals promise greater effectiveness, they should be adopted. If, however, an impartial jury pronounces them less effective, then the city deliberately attempts civic suicide or at least civic strangulation in adopting them. But it is not in human nature to choose the worse in preference to the better when both are seen equally clearly.

Above all things now, the city needs to see the meaning of the various proposals **in terms of the training of the young people.** A city cannot decide wrongly when it sees clearly.

The constructive proposals herein set forth are definite and concrete. Instruction is always central. It is regarded as the only thing that counts. It is looked upon as the only possible excuse for having a school district, or for any of the numerous things going on within the school district. Whether discussing the most general matters of organization, the material matters of building and equipment, or class-room matters relating to courses of study, teachers and text-books—whatever be the topic, we indicate how the proposal bears upon the question of improving the training. We have tried not to permit our discussion to slip into side issues. We have tried not to mistake means for ends.

The city should demand of those who make counter-proposals that such proposals be equally definite and concrete. Where the welfare each year of fifty thousand growing men and women is concerned, a city cannot afford to accept vagueness and high-sounding phrases as arguments. The men must be asked to show just how their proposals will improve instruction. There can be no other test. They must be brought to think their proposals in terms of the training. If they contend that general organization, finance, supplies, buildings and material equipment have nothing to do with the training, they merely disqualify themselves for discussion. If these things have nothing to do with the training, then they could be left out; for they certainly are not ends in themselves. Only as they provide the conditions of proper training directly or indirectly have they any reason for existence. Men must think all these things in terms of the training before they can rightly think them at all. They must do so before their arguments can be admitted as having any

bearing upon the real issue. They must not be permitted to slip into side issues, or to fog the main issue by setting up means in the place of ends and then discussing the means as if they were ends.

In many, many things Denver is now taking long steps forward. In nothing has the city taken a longer step than in its recent partial reorganization of the school system. It would now be strange indeed if the city should deliberately turn back. In an awakened city, however, such as Denver today, this is most improbable.

4. To control the employees of the Board.
  - (a) To determine the number of teachers that shall be employed. (Sec. 124.)
  - (b) To fix the salaries or wages of all employees. (Sec. 124.)
  - (c) To fix the compensation to be allowed the Secretary. (Sec. 124.)
5. To provide for the Board's own election and procedure.
  - (a) To adopt and amend by-laws, governing the Board's procedure. (Sec. 123.)
  - (b) To determine school election precincts, and otherwise provide for elections. (Secs. 142-145.)

### **Administrative Powers of the Board.**

The following administrative powers and duties of the Board are enumerated in the School Laws:

1. Buildings and equipment.
  - (a) To fix the site of each school building. (Secs. 124, 110, 148.)
  - (b) To build or remove school houses, and to purchase or sell school lots. (Sec. 124.)
  - (c) To rent, repair and insure school houses. (Sec. 124.)
  - (d) To provide school furniture and material equipment in general. (Sec. 124.)
  - (e) To purchase flags and maintain them on school buildings. (Sec. 155.)
  - (f) To direct the sale or other disposition to be made of any schoolhouse, or the site thereof, and such other property, real or personal, as may belong to the district. (Secs. 124, 110, 148.)
3. Supplies.
  - (a) To provide fuel and other necessities. (Secs. 110, 148.)
  - (b) To procure libraries, books, stationery. (Sec. 124.)
  - (c) To provide books for indigent children. (Sec. 124.)
  - (d) To furnish free textbooks for the use of all pupils, when authorized to do so by a majority vote of the district. (Sec. 124.)

4. Management of the teaching and supervisory staff and other employees.

- (a) To employ or discharge teachers, mechanics and laborers. (Sec. 124.)
- (b) To require teachers to conform to the law. (Sec. 124.)
- (c) To examine and certificate elementary and high school teachers. (Sec. 47.)

5. School organization and management.

- (a) To suspend, expel, or exclude pupils from school. (Sec. 124.)

There is, however, a blanket clause which gives the board the power "to transact generally such business as may tend to promote the cause of education in accordance with the provisions of this act" (110, 148). This places in the hands of the board everything of an administrative character except those matters that are placed in the hands of the secretary, the treasurer, the county superintendent, and the truant officer. The organization of the schools, the conduct of the schools, the employment of teachers and supervisors, clerks, janitors, engineers, the selection and purchase of text-books, supplies, and equipment, the selection of sites, the construction of buildings,—all of these vital administrative matters are placed wholly in the hands of the board of directors.

### **The Inspectorial Powers and Duties of the Board.**

The inspectorial labors of the board look in two directions. On the one hand, the board must furnish facts necessary for the county and state officials, and also for the general public in their inspectorial supervision of the school district of Denver:

- 1. The board must "make an annual report as required by law to the county superintendent. \* \* \*" (Sec. 124.)
- 2. The board must "make a report directly to the state superintendent whenever instructed by him so to do." (Sec. 124.)
- 3. Twice each year the board must publish "a complete report of the financial condition of the school district, showing all receipts and disbursements from each and every fund, so itemized as to give the general public definite information as to the financial condition of the district \* \* \*" (Sec. 125.)
- 4. "It shall be the duty of the board of directors \* \* \* to publish a complete report annually on the financial condition of their district, \* \* \* so itemized as to give the general pub-

lic definite information as to the financial condition of their district \* \* \*'' (Sec. 126.)

5. The secretary must file an annual report with the county superintendent of schools, showing the general status of the Denver schools; number of persons of school age reported in the census; number of schools, and the branches taught in each; pupils in each school; number of teachers employed in each school, and the compensation per month; number of days the school was taught; the name of the teacher of each school; number of pupils enrolled during the year, and the average daily attendance; the average cost per month per pupil; textbooks used; size of library; aggregate amount paid teachers; number of public school houses; value of houses; amount of revenues raised by tax; amount raised by subscription or other means; amount of special tax levied for school sites and furniture; amount of money on hand at the beginning of the year; amount of money received from all other sources. (Sec. 116.)

On the other hand, the board has inspectorial powers over the schools of Denver and over all officials and employees of the district.

1. The board has power to appoint and to remove all the major officials of the district: the secretary, the treasurer, the truant officer, the superintendent, etc. (Secs. 124, 75, 110.)
2. "The secretary shall render a statement of the condition of the finances as shown by the books at any time when required by the school board \* \* \*'' (Sec. 119.)
3. The board is required to examine the quarterly financial report and cancelled orders of the secretary. (Sec. 117.)
4. In putting the "conduct, affairs, and business" of the district in the hands of a board of education, they are in fact given inspectorial powers over all of the affairs of the district. Where administrative functions are delegated to superintendent, secretary, auditor, or other official, their action is always "subject to the approval or disapproval of the board." This inspectorial approval or disapproval of the acts of their employees is one of the board's major inspectorial functions.

### Origin of the Situation.

In the rural and village districts of the state it has naturally been possible to have only the unpaid boards of directors to manage the affairs of the schools. A small district having but one teacher, or even the two or three teachers of a village, cannot hire a district superintendent of schools, a district business manager, or a district attorney. They have insufficient need of such district officials. It has been found

necessary, therefore, in such districts, to place all of the various legislative, administrative, and inspectorial powers and duties in the hands of an unpaid and educationally untrained and inexperienced board of laymen. This may not be the best arrangement for even the rural districts; but it is the plan that has been commonly employed throughout the northern states of the Union.

The general educational legislation of Colorado has been designed primarily for the rural and village districts. These are most numerous; and most legislators come from regions where such districts are most numerous. The basic legislation originated also in the early days of the state, when there were no large city districts. It originated at a time when practically all districts were what are now called third-class districts. It was the best that could be done under the circumstances of that day.

As cities have grown up and conditions changed, second-class districts (population, 350-1,000) and first-class districts (population, 1,000 and over) have appeared. The plan has been to extend to them almost the identical legislation previously employed for the village district, making here and there a few changes, usually electoral and financial, that are necessitated by the larger organization. In general, however, as may be noted by a reading of the school code, the powers and duties of directors of third, second and first-class districts are practically the same.

A form of school government devised in the main for rural and village districts has been rather unconsciously inherited by the large metropolitan city of Denver. In the legal organization of its school system, the city is in the position of one who has grown to be a man, while still wearing the form of clothing used as a child. Such a form of organization adapted in the main for third-class districts is a misfit for the large first-class district of Denver. The city needs a new school charter that is based upon the practices of large cities rather than one that has grown out of village systems.

### **Definition of Major Functions.**

The controlling legislation does not attempt to distinguish the three major types of function to be performed within a school district: the legislative, the administrative, and the inspectorial. For reasons mentioned above, there has been little attempt to distribute the various functions so as to secure a maximum of good management. Let us try to make clear the nature of the three kinds of duties, and show why they need to be distinguished one from another.



1. The city needs first to lay out the lines of general policy to be pursued. These policies should take into account every important factor concerned, and should carefully adjust it to the city's needs. The policies should be formulated with deliberation only after the assembling of facts and evidence. They should be formulated clearly and adhered to consistently. These legislative deliberations and decisions are the rightful functions of the board of directors.

2. General policies have to be translated into action. Things determined upon have to be done. The executive or administrative activities consist merely of doing the detailed work involved in carrying out the board's legislative orders. A professionally untrained board may try to carry out their own orders; or they may secure a professionally trained executive to do it for them. Whether they employ the one method or the other, they ought for reasons presently to be mentioned, to distinguish between the legislative function of drawing up the general orders, and the administrative function of doing the work in obedience to those orders.

3. After the work has been done,—whether by the board itself or by trained executives,—it ought to be carefully and systematically inspected to see that it complies with the plans and specifications laid down in the general legislation. This is a function that belongs rightly to those who legislate. The board who gives the orders are the ones to see whether they have been obeyed, and whether the work has been faithfully done.

### **Legislative Difficulties.**

The board will always meet certain difficulties in its legislation if it is its own executive:

(1) There will be no full development and definition of general policies, because of the lack of motive. It is easy for the board to make current judgment as they go along without previous and careful deliberation and legislative decision as to general policy. Without such general legislation they have greater freedom to decide, now this way, now that, as they are confronted by the same question under different personal, political, or sectarian conditions. Action is more comfortable when there are no limitations. When a board is engaged in the task of setting up legislative limitations upon its own acts, it is usually found to be a task that mostly goes undone. To bind responsibility firmly upon one's self is not a task that is usually well done. The board will fix responsibility upon men through their legislation with greater zeal and

effectiveness if they are legislating for other men's acts rather than for their own.

(2) There will not be consistency and permanence of general policy. When those who are obeying the laws are free to change them whenever they like, they will alter, amend, and repeal whenever it suits their convenience to do so. Should the board, under such circumstances, be so fortunate as once to have a system of well-formulated general policies, they could not for long withstand temptations to change them. The policies would wither away and disappear. **Consistent farseeing legislation will develop and flourish only when those responsible for the legislation are removed from all the temptations met with in the application of it.** Good legislation will appear only when the board of directors are legislating for those executives to whom they are delegating all administrative and executive functions.

### **Inspectorial Difficulties.**

Where the board is its own executive, there rises not only a difficulty but an absurdity in the performance of its inspectorial duties. **The board is the inspector of its own acts.** It is a judge that sits upon its own case. It represents a highly undesirable condition of executive irresponsibility. However honest and public-spirited men may be, human nature is not so constituted that men will check up themselves with the same disinterested detachment possible in checking up somebody else. The board, it would appear, should either perform the administrative labors and have somebody else legally constituted to check them up; or they should make somebody else fully responsible for administrative labors, and perform the inspectorial functions themselves. Self-inspection with nothing to re-enforce it but what is self-imposed is about the same as no inspection.

Those who legislate are the ones who should inspect; those who have decided what general policies should be carried out are the ones to see whether the labors intended are being faithfully performed.

Legislation belongs to the board of directors,—as responsibly advised by the community on the one hand and the school people on the other. Inspection of results belongs to the board of directors, since this alone enables them to know whether their legislation is proving effective. Forceful and efficient business administration is impossible, however, if the board selects itself as the administrator. For a proper division of functions they must select somebody else as their agent in carrying out the administrative labors. And moreover, as indicated by the practice of all good business management, they must select admin-

istrators who are trained and experienced specialists in the work to be done. The world of government and the world of business, when they try to secure efficiency, are both generally agreed that **legislation** and **inspection** belong to laymen; while administration must be placed in the hands of men specially capable and experienced in the work to be done.

### **Complementary Legislation.**

The board of directors of Denver is to be commended for having recognized these deficiencies in the legal arrangements provided by the state laws, and for having recently passed complementary legislation which provides for such division of functions that the board performs its two rightful kinds of duties and employs experienced executives to perform the third kind under its general direction and inspection. The city is to be congratulated upon this recognition and adoption of principles of good management for their schools.

The chief administrative officer of the board is naturally the superintendent of instruction. The central purpose for which the district was created originally, for which taxes are collected currently, buildings constructed, supplies purchased, teachers employed, etc., is instruction. Everything else is instrumental and auxiliary to this. The only rational arrangement possible, therefore, is to make, as the board has made, the superintendent responsible for the administration of the school system.

The complaint is heard that by the recent reorganization of the system the board is shorn of its powers and duties. Nothing of the kind has occurred. The three kinds of powers and duties given the board by state law are theirs still; and the labors must still be performed. Simply, the board has substituted an effective method for the previous relatively ineffective one. They are performing two kinds of functions themselves, and hiring trained hands to do the third for them under their general direction and inspection.

As it now stands in the general outlines of organization, the Denver school system is well abreast of the best in the country. Its reorganization is incomplete as yet, it has not yet chosen all of the necessary officials, it needs the stabilizing that can come only from a new school charter which guarantees to the people and to the various officials concerned their proper rights, powers, and duties. These further things, however, can come as the fruits of the things now begun. The chief thing to note at present is that the board of directors is taking the only road that leads to that business-like management which alone can bring efficiency to the work of the schools.

### The Board of Directors.

The city is fortunate for the present in having the government of the school district separate from that of the municipal district; in having members of the board of directors elected at large; in having a small board; in giving board members long terms; in a mode of election that permits a gradual change of the personnel of the board; and in the absence of executive board committees.

In a few things the people of the district are not so fortunate:

(1) The change in the personnel of the board is not sufficiently gradual. After two of the elections every six years, when two out of five are elected, the new, inexperienced members of the board constitute almost half of it. But if at the same time there is an extra vacancy to be filled, the inexperienced, untried members actually constitute a majority. The city should never entrust the welfare of its youth in the hands of an unproved and inexperienced majority.

Where there is a board so small as five,—a proper number for Denver,—one new member should be selected annually; and should serve for five-year terms. Since elections are expensive, this raises the question whether it may not be possible to devise an appointive method. This could be justified by the usual arguments for the short ballot.

If the city prefers to continue election at large, there are other devices that could be used by way of bringing about a more gradual change of board personnel. It is possible at two of the elections each six years, to choose two members, for six-year terms, one of whom takes his seat at once, while the other takes his seat one year later. This method would really mean fewer inexperienced members than if one were elected each year. The one who waited a year, if sufficiently interested in the work to keep in touch with it,—and no other type should be chosen,—would really be serving a year of apprenticeship without the power of vote.

If board members must take their seats at once after election, if elections must be biennial, and if members are to serve six years, then it may appear that a board of seven would be safer than a board of five. We do not recommend this change. The city wants only responsible people to serve on its board. Since men of this type always have other affairs of importance, their services are not easily secured. If the city can secure five men of this type, it will be fortunate. It should not seek further. So difficult are they to secure, that there would be a temptation for the city in the selection of the other two to content itself with men of lesser caliber, who would not only be of no service but who would be continually obstructing the beneficent policies of larger-calibered men.

Broadly capable men of the type that the city needs upon its school board will understand the value of business methods in the conduct of the schools. They will be content to outline general policies, to approve the details of policy as drawn up by their executives, to get things done by those executives instead of trying to do them themselves, and then to review results to see that the things have been efficiently done. Little men on the board, however, cannot understand these broad business methods. They want always to be mixing into the details of things. They are unable to distinguish between **doing things** and **getting things done**. They think the only way to get results is to do things themselves. The business man knows better. He knows that the best way to get results is to turn each job over to the proper expert, and **then to see that this expert does the work and gets the results**.

Men of large capacity on the board can do things expeditiously, just because they employ business methods. This makes it easier—far easier—to secure capable men for membership upon the board. When little men are placed upon such a board, they are always getting in the way, and preventing the use of business methods. Business-like expeditiousness disappears. Broad-minded men leave the board in disgust; and it is difficult to induce others of like character to take their places.

For these reasons chiefly, the city cannot afford to increase the number of members on the board of directors. The city should find some less mischievous method of bringing about the gradual change in the personnel of the board.

(2) A second defect in the present situation is the mode of filling a vacancy upon the board pending an election, which in extreme cases may be almost two years distant. The law provides that the board itself select to fill such vacancies. This permits an interested majority upon the board to increase its power and further to intrench itself for the future. It permits two individual members to deadlock the board and stop all business. The present demoralization of school affairs in Denver is a sufficient example of the malign effects of such a deadlock.

The city needs a method of filling a vacancy that will avoid these evils. Since a special election is considered too expensive, there is simply the problem of finding that method of responsible appointment that will best voice the wishes of the people of the district. When men in public service are willing to put public welfare above partizanship, the problem will be easy. At present it is all but insoluble. There is no legal machinery that can serve as a substitute for public spirit.

In general we are not intending here to discuss the findings of fact as regards the past labors of the board of directors. The minutes have been read from 1902 to date, and the nature of this past history is clear both to the writer and to the community. In our discussion we intend to assume that the community is familiar with this history. And now that the board has broken with its past, and started out anew on the basis of sound organization, it can be of far greater service if we devote most of our space to constructive recommendations and to an explanation of the reasons for these recommendations. They are not presented as finalities that are to be accepted without discussion. They are intended in part at least to precipitate that discussion out of which a community crystallizes its own judgment.



## LEGISLATIVE FUNCTIONS

As the board of directors enters upon its new regime, its first large problems relate to the development of methods of effective legislation and inspection. In the past it has administered its schools mainly on the basis of current judgment without the stabilizing influence of fixed general policy. Hence the latter is mostly non-defined as yet. The method also of gathering facts and evidence necessary for deliberative legislation likewise remains very incompletely developed. The board with three kinds of functions to perform has been busied chiefly with only one of them. This happens to have been just the one that a lay board of directors—whether of a school corporation or any other kind of corporation—ought always to delegate to its trained executive agents. So fully has the board been occupied with administrative matters—and with laudable sacrifice of time, labor, and personal convenience, it must be said, greater than that made by most of its critics—they have not had the time nor the necessary motives for finding ways and means of developing their legislative and inspectorial functions. It is this situation which lends color to the mistaken charge that in properly delegating one of its three kinds of functions, it is delegating all of its functions. It is the failure to recognize the power of legislation and inspection to control administration that permits the mistaken charge of “irresponsible one-man power.” It is the very business of legislation and inspection to set the limits and the goals of the administration, and to see that it remains within these limits and that it attains these goals. If administration so delegated by the board is irresponsible, it is because the board has not fully developed and performed its legislative and inspectorial functions.

The two large board problems at present are: (1) Legislatively fixing the limits and goals of administrative action; and (2) at the same time, finding the methods and means of inspection that will effectively determine whether the work is kept within the limits, and whether the goals are attained.

In order to make our meaning clear, let us first mention some of the topics upon which legislation is needed and also the methods of carrying out the work. One of the first questions which the board must answer in its legislative program is:

**I. What are the kinds of educational work to be done within the school system?**

To reduce the question to more specific terms:

Shall the schools continue to offer manual training, domestic science, domestic art, school gardening, commercial work, in the grammar grades?

Shall kindergartens be established in every building?

Shall printing as a form of manual training be made accessible for all grammar grade pupils?

Shall gymnasium opportunities be introduced into every elementary and high school building?

Shall swimming, the facilities being indoor swimming pools, be taught as a portion of the physical training in each of the high school buildings?

Shall the work of the school nurse be introduced and made general throughout the city system?

Should open-air teaching be made possible for any pupil who needs it, whether elementary or secondary?

Should the board secure free public library service for every building?

Should evening social, civic, and recreation centers be established and maintained generally in the schools of the city?

Should German be taught in the grades?

Should there be outdoor physical training, systematically maintained upon all school grounds before and after the school sessions?

Should schools be opened for study classes during the evenings?

Should Saturday forenoon classes be maintained?

Should there be summer vacation schools?

Should co-operative part-time work be developed in connection with the trade and technical high schools, on the one hand, and the mechanical trades of the community, upon the other?

Should continuation schools be established?

Should music be given credit in the high schools as fully as foreign languages?

Should a course in vocational guidance be inaugurated in the different high schools?

Should a system of school savings banks be established?

Should the home-garden movement be developed as a part of the regular training?

Shall a central day truant school be established, of a special type for those boys that are difficult to handle?

Shall there be special classes for the subnormal, the backward, the deaf, the tubercular, the crippled, etc.?

Shall there be separate classes in order to enable the especially bright to move forward with greater rapidity?

Shall auditorium activities be introduced into each of the elementary buildings?

Shall folk dancing, rhythmic dancing, athletics, and plays and games, take the place of the formal calisthenics now employed in physical education?

Shall the luncheon hour be utilized for the social training of high school pupils?

Shall military training be made a part of the public school program?

Shall pupil government be employed in the high schools?

Shall junior high schools be established?

Should the high schools offer six years of work instead of the present four?

Should the school buildings be utilized Sunday afternoons?

Should the so-called home-schools for girls be established and maintained?

Should the city have a specialized commercial high school, or would it be better to vitalize the commercial work in the regular high schools?

What effective provision should be made for the vocational training of all of the youth of Denver?

What training should be offered by way of keeping all children in school for full time or part time until an adequate training for all desirable adult activities is secured?

What should the schools do—especially the high schools—by way of more effectually training for citizenship?

What should the schools do by way of effectively training for health and physical efficiency?

What should the schools offer by way of training for healthy and socially desirable leisure occupations?

What educational and social opportunities should the schools offer the adult population of the city?

It will be observed that this first problem of determining the kinds of educational work that the school system shall perform opens up an endless stretch of problems for legislation. When a question is presented, it is an easy thing to make snap judgment and to legislate without deliberation. It is quite another thing to study each question as a judge studies an important legal case, where he carefully gathers all possible evidence bearing upon it, carefully weighs the evidence pro and con, examines all of the law bearing upon the case, and finally makes deliberative judgment as to what is to be done.

Every legislative decision of the school board in the city of Denver relates to the welfare directly or indirectly of more than 35,000 children. It is not too much to ask that facts bearing upon every problem be gathered in the most careful and complete manner, and that there be deliberative judgment based upon evidence.

Now what kind of facts will the board gather, and how will it proceed? Let us illustrate by taking, for example, the question: Shall part-time industrial work be established for the carpentry students in the Denver School of Trades? The question means in other words, Shall an arrangement be made with the building contractors of the city whereby it will be possible for the students in the School of Trades to work a specified number of hours per week in actual building labors at a wage adjusted to the quality of work that they can do, this outside work to be a regular part of the course of training of carpenters in the Trade School? The first task of the board is clearly to define the problem, and to discover the different classes of people who are interested. Clearly it is of interest to the building contractors of the city. It is of interest to the carpenters' union, and to labor unions in general. Manufacturing, building, commercial, and railroad organizations are interested because it involves a principle of education applicable to all. Parent-associations are interested, since it is the education of their sons that is involved. The superintendent is interested, since he must direct the work in its general outlines. The principal of the Trade School and the faculty of the Trade School are interested, since they must perform the details of the labors. Civic organizations in the city are interested, since the efficient training of workmen is a necessary portion of the adequate training of citizens. But persons vitally interested in this problem are not confined to the city of Denver. In the state University, the state Agricultural College, the state School of Mines, the state Normal schools, and in the other colleges of the state, there are specialists who have given time to a study of the workings of this particular kind of education, and who have expert knowledge bearing upon the whole question. The same can be said of men in the more distant universities of other states. Many large Business Men's Associations through the country have been accumulating facts bearing upon the problem. In the United States Bureau of Education at Washington is an industrial specialist employed by the government to give advice on all such questions. The Bureau of Labor at Washington also has assembled a large quantity of pertinent facts. Special industrial commissions have been at work for years in many states studying this particular question among others, and making recommendations. Superintendents and special directors of industrial education are to be found now in many

of our cities who have actually established and are maintaining and supervising part-time education. Naturally they are not only interested in the problem, but have a wealth of practical information as to its actual workings.

As the school board looks about to see who is interested in the question, and who has information upon it derived either from observation or from experience, they can have no difficulty in locating large numbers of men from whom to obtain the necessary information. They will invite a responsible committee to meet with them from the building contractors of the city; another such committee from the carpenters' union; and in the same way they will invite a responsible committee from each of the organizations or social groups of Denver who are vitally interested in the problem. They will likewise call in superintendent, assistant superintendents, principal and teachers of the Trade School, and any other educational people who have vital interest in the problem, or who have special information to give. They may find the question of sufficient importance to invite in the specially informed men from the State University and the other State educational institutions. Through correspondence and otherwise, they will obtain information as to the findings and the practices throughout the country.

With such wealth of information bearing upon the question, the board is ready to deliberate and to make decision. The general policy arrived at after such mature consideration of facts is likely, in reasonable degree at least, to fit the needs of the community. It is likely to be held to consistently because it is grounded not in mere passing whim or prejudice, but in a great weight of evidence. Snap judgment unrooted in evidence is likely to change with every breeze of passing opinion. Deliberative judgment, growing out of full evidence, is securely anchored and fortified against mere passing opinion.

A board of education is not to be a passive body waiting for volunteer advice and information on the part of those interested in some educational measure. The board is to be an active deliberative body finding the educational problems that need to be examined into, defining them, sending out for committees from the community who can give information, sending out to experts in their own and other states for information, and generally finding out the practices in other cities through the country.

After all of this investigation and study of a question requiring legislation, the board is qualified to do just two things: (1) To make decision as to the general policy to be adopted; (2) To pass judgment upon the plans designed to put these general policies into execution,



as these are drawn up and presented for approval or disapproval by their qualified executive agents.

We have mentioned the labors incident to legislation relative to but a single problem. Each of the others enumerated will require labors of similar character and magnitude. If one will figure out the kinds of evidence that need to be secured bearing upon each of them, and the amount and character of the labors involved in securing this evidence and in deliberating upon it, it will be impossible for such a one again to repeat the absurd statement that in hiring an able executive for carrying out all administrative details, the board has nothing left to do that is worth their while. In the legislation referred to, which is but a beginning of all of the labors for which they must be responsible, they have tasks worthy of a man's full strength.

Now let us suppose that the board has deliberated upon all the problems above mentioned and all other pressing ones of similar character, and has decided upon the things that are to be done. A second general question then arises:

## **II. How Well Is Each Kind of Work to Be Done?**

The quality of the work is determined by the board in its legislative determination of the conditions under which it is to be performed. The board must legislate as to all of these conditions. It must answer legislatively such questions as the following:

Shall the number of teachers authorized be such as to permit classes of reasonable size, and thus to make superior work possible; or shall the number of teachers be so small that the resulting large classes make good work impossible?

Shall the city secure good work by paying a teacher's salary high enough to secure superior teachers; or shall it purchase poor work by paying a salary so low that good teachers cannot be attracted or permanently retained?

Is the work of the schools to be kept upon a high plane through the development of adequate supervision; or is it to be left upon a lower plane by providing a less adequate amount of supervision?

Is the work to be made superior through the provision of a high quality and a generous quantity of material equipment; or is it to be of an inferior quality because of insufficient quantity and an inadequate quality of equipment?

Is the work to be made superior through utilizing some of the time that is now lost Saturdays and vacations?

Shall teachers be made to feel absolutely secure in their positions

so long as they do good work; or is insecurity of tenure to cause that demoralization of the teaching corps that renders good work impossible, and forces strong teachers to seek positions in other cities where their labors are more valued?

Is a high standard of teaching ability to be assured by placing the examination, certification, and nomination of all teachers in the hands of the superintendent and his staff; or is a lower standard to be assured by having examinations, certification and appointment performed by laymen?

Shall the city buy good work by paying a relatively high cost per pupil, or poor work at a low cost per pupil?

Shall the number of high school teachers authorized be such that the size of classes will average about twenty pupils, thirty pupils, or forty pupils?

Shall the number of high school teachers authorized be such as to permit a 4-period, 5-period, 6-period, or 7-period day for the teachers?

Shall the school system have the administrative consistency and those conditions of forceful constructive progress that can come only from long tenure in office of a strong superintendent; or shall the city follow its recent discreditable history of beginning all over again every three years?

How many assistant superintendents ought to be employed by way of making it possible for the overhead management to keep in effective touch at all times with all the 1,250 employees within the system?

Are building principals to do professional supervisory work, or are they to continue to perform such routine and clerical labors as could be done by \$1,000 teacher-clerks?

What provisions should be definitely made for encouraging good teachers to remain in the service?

What provisions should be made for the purpose of making a good teacher of every one now in the service?

Most of these questions can be answered off-hand, without the trouble of gathering facts for sound, deliberative judgment. Directors guided by whim, prejudice, tradition, politics, or sectarianism can make snap judgment on such questions as rapidly as they are presented. An awakened city that would stand for this method of judgment when the vital interests of 35,000 people are currently at stake would deserve the mismanagement, the inefficiency, and the waste of money that would result. In the civic awakening so evident now throughout all portions of Denver life, it is inconceivable that the city will longer tolerate leg-

islative judgment that is not based upon thorough investigation, and the careful gathering of evidence.

Take, for example, the matter of strengthening the overhead management. Shall the board authorize the appointment of assistant superintendents? It is easy enough to say off-hand, We authorize them, or, We decline to authorize them. It is quite another thing to ascertain just what it is **in the classrooms of the city, in the situation of teachers and principals, and in the field of material equipment**, that demands the services of assistant superintendents. The board, however, cannot really begin to consider the advisability of such a measure until the evidence is placed before them. Some of the detailed evidence that they need for the purpose is presented in other portions of this report.

In addition to such studies otherwise presented of conditions within the system that demand the labors of assistant superintendents, the board will gather evidence as to what is being done in other cities of the size of Denver. The accompanying table represents a sample of the type of facts that should be gathered:

**TABLE I.**

**Number Assistant Superintendents in 17 Cities of Population Class of Denver.  
From Report of U. S. Bureau of Education, 1914.**

Superintendents No. of Asst.	Superintendents No. of Asst.
Portland . . . . .4	Oakland . . . . .2
Kansas City, Mo. . . . .4	Jersey City . . . . .1
Seattle . . . . .3	Columbus . . . . .1
Indianapolis . . . . .3	Toledo . . . . .1
Providence . . . . .3	Atlanta . . . . .1
Worcester . . . . .3	St. Paul . . . . .0
Minneapolis . . . . .2	Louisville . . . . .0
Washington . . . . .2	DENVER . . . . .0
Rochester . . . . .2	

Such a table represents the judgments of practical men in many cities. It is one of the most valuable kinds of evidence that the board can collect. Many things are to be taken into account, of course, besides such evidence; but looking to this evidence alone, it would appear that the board in its legislation in Denver would be entirely safe in legislatively authorizing two assistant superintendents for the direction of instruction.

After the board has legislated as to the several score things to be done in the school system; and also after it has legislated as to several other score factors that relate to conditions underlying the quality of the instruction, it meets a third general legislative problem:



### III. The Budget and the Tax Levy.

In enacting the legislation relative to the various things referred to above, the solid foundation is laid for a scientific budget. The legislation authorizes the things that are to be paid for. Having determined these various things, it is then possible to ascertain each year that size of each that will accurately fit the current demands of the school system. Thus can be figured out in advance the cost of each budget factor. It need not, as in the past, be based simply upon the previous year's experience and lay a foundation for repeating all the errors of the previous year. The plan mentioned permits each year a new attack upon the budget problem. It permits the board to profit by the errors made in previous years and by the experience gained from the making year after year of ever better and better analyses of conditions. The plan makes possible a multitude of economies without in any way affecting the quality of the educational work. By economies here we do not mean that the total expenses of operation may be diminished. As the quality of the work is taken care of more and more adequately, expenses per pupil may conceivably increase still further. The economy referred to is the **prevention of waste**—the making of every dollar actually spent secure the largest possible returns.

Since the large field of budget-making is handled in another portion of the survey report, there is no need to make further suggestions here. We wish only to indicate that the budget is intimately and inseparably bound up with and prepared for by all of the legislation of the board. It is not a thing that can be handled rationally or scientifically until this legislation has been developed. Until such time, the budget will represent but the summation of a series of guesses and accidents.

### IV. Other Fields of Legislative Activity.

An examination of the legislative functions enumerated at the beginning of this report will reveal other kinds of legislative activity for which the board of directors is responsible. There is no need of our discussing more of them, however. We have desired chiefly to show the large province of responsibility for the board of directors that lies in the legislative field. We have desired also to make it impossible for one to repeat the charge again that in employing administrative officials for carrying out its legislative mandates, the board of directors becomes a mere rubber-stamp appendage of the superintendent's office with no real responsibility. As a matter of fact, the legislative responsibilities resting upon the board are of gigantic proportions. Let the board give

to its legislative problems as much time as it will, it cannot give more time than their importance demands. Even then the board of directors will not be able to find time enough to perform of itself a quarter of the labor necessary for providing the desirable legislation, and for continually reviewing it and revising it as conditions change, or as experience teaches wisdom. Even the collection of facts and suggestions as to legislation will have in a large measure to be delegated to those who are expert in the work of education and expert in the gathering such facts. Naturally here is a large and as yet mostly undeveloped province of labor for the secretary of the board.

### **Legislative Responsibilities of Professional People.**

In general, however, the board will have to rely greatly upon the professional people within the school system. A very common by-law to be found in the school board manuals of cities, places this function upon the superintendent. Here is one from Kansas City, Mo.:

“The Superintendent shall keep himself and the Board constantly informed in regard to the school systems of other cities—their plans of organization, modes of government, methods of instruction, and such other matters as may assist the Board to legislate wisely for the highest interests of the schools of the District.”

This is one of the large normal responsibilities of the superintendent. When the board is legislating as to general policies, because of the fact that they are laymen, they cannot proceed with safety except as they are in constant consultation with their specialist executive agent and adviser. And he will bear the chief responsibility for filling in all of the details of their general legislation.

A superintendent, however, might give his whole time to this one task, and then not be able adequately to meet all of the demands because of the magnitude of it. He has, however, a multitude of other responsibilities. He must in fact delegate responsibilities to subordinates as fully as possible in this as in most of his other labors. Assistant superintendents are needed who are specially informed as to education in general, educational movements throughout the country, and more specifically still as to the needs of the various school districts in the city of Denver. Special supervisors of different subjects need to keep constantly informed not only of conditions within Denver, but also of all developments throughout the country within their fields of work. The principals of buildings should be liberated from clerical and routine duties, and required as a part of their functions those analyses of the

educational needs of their districts necessary for finding the facts required for intelligent legislation. The assistant superintendent in charge of business affairs should have special information as to the business methods that are employed in the management of progressive school systems throughout the country; this information is then at the disposal of the board for their legislation. The supervising engineer, the chief of janitors, the superintendent of supplies, the school architect, and each of the various other special officers, should be required to keep themselves fully informed as to methods and practices in their lines of work throughout the cities of the country. This information should then be the basis not only for keeping their work up to a high standard, but also for giving facts to the board for its legislation. In so large a body as the teaching force of Denver, elementary and secondary, there are also numerous specially competent teachers whose training, experience, observation, and general information should be drawn upon in this assembling of information. The board has never attempted systematically to utilize this great wealth of potential and actual information that lies right at hand. It has purchased high ability at a high price; but has not tried to secure the greatest possible advantage from the presence of this ability.

### **What Teachers Can Do.**

The following plan is at least a conceivable method of enlisting the capable people of the school system in the work. Let the board say to a specially qualified high school teacher: "We should like for you to investigate as fully as you can all aspects of the question of equipment for physical education in high schools." With such a commission, the teacher will gather information on the subject through reading, correspondence, observation in neighboring cities, consultation with physical directors and teachers, with physicians, parents, other high school teachers, etc. Without greatly adding to his or her total labors the teacher can in fact become a competent specialist, qualified to advise superintendent and school board upon that one topic. To a second specially qualified teacher or principal, let the school board assign the topic of school seating; to a third, the use of the school plant on Saturdays; to a fourth, the teaching of German in the grammar grades, etc., etc. It is possible thus to distribute several score questions for investigation among several score teachers or committees of teachers. It is a method of division of labor made necessary by the magnitude of the total task. There are plenty of competent people within the teaching corps of Denver to carry it out. Those who are fit for the work will be

glad to do it. In fact no teacher who is fit to be employed as a teacher will refuse the responsibility. It gives them the kind of chance that all live teachers want. It permits them to enter into and participate actively in a larger world than the class-room world, where they deal only with children. It permits them to be adults among adults, and to mingle responsibly in adult affairs. It gives them wider interests, wider outlook, and fits them for doing better work in their class-room teaching. It shows them that the world is restlessly striving everywhere for ever better things—a very proper thing for teachers to be brought to realize, if they are to be kept alive and striving.

Naturally for such work the particular teachers or principals would have to be chosen with care. Not all are equally diligent; some have a wrong special bias; some may be so visionary as to seek the impossible, while others may be too deep in the ruts of tradition. The board, however, in gathering information for legislative purposes, will secure its information through many channels. It will thus be easy to locate those who are unable to bear such responsibility—and they can be asked to step aside until they have attained their educational bearings. One large function of the superintendent and assistant superintendents is to keep in constant co-operative contact with such teacher-investigators for purposes of advice and guidance.

There is a further reason for this special help of professional people. The board's legislation will necessarily be general. It will present the outlines. The school people themselves will have to fill in the details as they carry out the work. It is well, therefore, that school board and professional people should have in mind the same things. If the professional people gather facts for the double purpose of the general legislation of the board and special application within their work, and if both go over all of the facts together, then all are upon a common standing ground. Than this, there is nothing more greatly to be desired. The board in passing general legislation can thus know the direction that it will take in its specific workings. The school people on the other hand can know with certainty what the board expects them to do as they fill in the details of the general outline. The school people further know what is in the minds of the board when they are exercising their inspectorial functions.

There is nothing in the educational field more greatly needed than a broad ground of common understanding upon which the community, the school board, and all the school people can meet and plan and labor. Above all things, the city is in need of a unification of its thinking on basic problems and of a greater mutual tolerance. As a means of bring-

ing this about, nothing can compare with getting together, discussing problems, planning and working—all for a common end.

### **Board's Legislation Must Be General.**

Most of the legislation of the board must relate to things of such an intricate character that the board simply cannot draw up the details. Generally the details will have to be drawn up for them by specialists. We can make this clear with an illustration. When the board has wished to construct a school building it has been necessary to legislate in a merely general way as to the kind of building desired. The architect then took this general legislation and drew up the detailed plans and specifications for the building. In formally accepting these plans and specifications the board was really legislating as to the details. It could not itself have drawn up these details of the legislation; but in thus using the specialist the board gives up none of its prerogatives or responsibilities. The specialist, in this case the architect, is only an employed helper in the work.

In exactly the same way, when the board wishes to legislate as to the establishment of some new educational feature, as for example a commercial high school or a more vitalized type of commercial course in the present high schools, the board can express legislatively its general wishes as to the general outlines of it. They will then need to leave to their employed educational specialists the labors of drawing up the detailed plans and specifications. While a lay board ordinarily is not qualified to draw up such plans and specifications, still if they have examined the plans used in other cities and have otherwise familiarized themselves with the nature of the work in ways herein recommended, they can usually judge of the adequacy of the plans and specifications presented to them by their educational specialists.

**If they cannot judge of such plans made by others, then they are not equipped to draw up the plans themselves.**

The formulation of the budget presents another example. The board can legislate in a general way as to what the community is willing to expend on public education; but the making of an educational budget which measures every factor and accurately adjusts every item requires far more specialized professional information than a lay board can possibly possess. Only those who are familiar with the infinitely complicated and invisible factors involved in the instruction—the things that are to be served effectively by every item in the budget—can draw up the details of a scientific budget for the educational organization.



After the budget is drawn up, however, before it is legislatively passed by the board, naturally the latter is charged with the responsibility of carefully examining each of the various items. This is what we may call an exercise of their inspectorial functions as related to the labors of those employed in helping them to draw up the details of their legislation. For the inspectorial labors herein involved they will need to have full and exact information as to the financial aspects of each of the various educational factors to which each item of the budget refers. They must have unit-costs of each budgetary factor for the previous years in Denver. They need also, for comparative purposes, unit-costs for each of the factors for many other cities of the United States. They need to have explanations of any divergences from past practice or from the usual practice of cities, explanations of increases here, decreases there, etc. With all of this information before the board they are prepared to give a detailed examination of the scientific budget as laid before them by their educational specialists, and prepared for deliberative decision.

**If the board of directors is not in a position to judge as to each of the items of the budget that is laid before them, then they are not qualified themselves to formulate a scientific budget.**

In thus employing expert help in drawing up some of its legislation, the board gives over none of its legislative responsibilities to other individuals. These responsibilities they cannot delegate. They simply are employing expert help for kinds of work which they are not themselves qualified to do. This is not to imply any incapacity in the board members. It is merely to recognize that we live in an age of specialization, where complicated labors are universally given over to specialists. When a business man hires an architect to help him in performing certain of his duties, a lawyer for performing certain other duties, and a stenographer for performing still others, there is no implication of incapacity in such business man. He is merely using business methods instead of being an inefficient and blundering jack-of-all-trades himself. The school board that does not employ similar methods is not running its affairs in business-like ways.

**The board of directors will enact all of the general legislation. This should be quite general. The details will be filled in by specialists. The board will examine and see that the details filled in by the specialists appear to be the things intended and desired. Satisfied as to this, the board will approve and will thus be responsible for any detailed legislation.**

Nothing said here can imply that the board can omit securing full information for legislative purposes of the kinds referred to in earlier portions of this chapter. The board cannot judge of the recommendations of specialists except as it has full and detailed information.

### **Legislative Library.**

There is pressing need of the development of a school board library for legislative purposes. In securing the bulletins of the U. S. Bureau of Education and the annual reports of other cities, the superintendent has recently made a good beginning. Provision needs to be made for securing books, reports, periodicals, bulletins, etc., that show current progressive developments all over the country. As a first further step, let us recommend that the American School Board Journal be made available.

## ADMINISTRATIVE FUNCTIONS

The only thing to be aimed at in the work of the schools is the **training of the children.**

The city is not interested in school buildings, play-grounds, books, studies, libraries, supplies, prerogatives of board members, prerogatives of superintendent, the form of organization of the system, the nature of the by-laws, etc., except as these things make for efficiency in the one thing desired. These things have to be taken care of simply because they do greatly affect the efficiency of the training itself. But no one of them is an end in itself. Each is but one of the many means to be employed in securing the central end of the training.

After the board has legislated as to the general policies that are to control in the conduct of this training, then to be well done it must be turned over to their chosen executive agent, the superintendent, for accomplishment. He is the board's expert employed to take care of the details of the one thing that the whole school system exists to do. But the work of training involves control of all of the **means** to be employed in the training. The processes necessary are endlessly complicated. The means to be employed in these processes are equally complicated. All of the things, however, must be carefully chosen, adjusted, and coordinated so that they may rightly serve in the training.

The means, agencies, and other factors of training that the superintendent must control in order to do his work, include the professional qualifications of his subordinates and helpers; the methods of work of his subordinates and helpers; the textbooks, supplementary books, supplies, shops, laboratory and playground equipment, school gardens, etc., that must be used in the immediate processes of training; the buildings, playgrounds, furniture, lighting, ventilation, sanitation, aesthetic influences, etc., that supply the environmental portion of the training processes and which must be controlled by the director of instruction if they would be accurately adjusted to the training needs; the agency concerned in keeping the children in school with regularity; the agency concerned in keeping the children in physical condition to receive instruction; the distribution of the time over the various things to be done so as to secure the greatest possible amount of results; the distribution of the total amount of money which the community is willing to invest in education so as to secure the most possible for every dollar expended; that classification of pupils that will



secure the greatest economy and effectiveness in the work; that placing of his subordinates where they will be able to accomplish the greatest amount of educational service.

The superintendent must control the department which directly gives the instruction; and also departments which supply the means and envioning conditions of such instruction. Under the direction of the superintendent, therefore, and responsible to him will therefore be found: Assistant superintendents in charge of instruction, assistant superintendent in charge of business affairs, supervisors of special subjects, principals, teachers, architect, the health director, the attendance officers, school nurses, school librarians, the supervising engineer, purchasing agent, storekeeper, engineers and janitors.

The superintendent will examine and appoint his subordinates. If he is to be held responsible for making their work count in terms of the training, he cannot have them examined or appointed by anybody else. Naturally the board of directors is expected to exercise sufficiently its legal duties of inspectorial supervision of such appointments through antecedent approval or disapproval. If it disapproves, the appointment is not made. If it approves, it makes little difference who performs the mere formalities, whether superintendent, board, or secretary. The essential thing is that the superintendent alone take the initiative in naming all his subordinates; and that at the same time the board have full power of general control through inspectorial approval or disapproval.

### **Denver's Excellent Organization.**

This general statement is made in order to indicate the general superiority of the plan of administrative organization recently adopted by the Denver board of school directors. Since this reorganization, administrative functions are well placed. The superintendent is made in fact as well as in name the chief executive of the board. He is made responsible for carrying out the legislative mandates of the board. Since he is thus made responsible for the work, he is given control over the means that are to be employed in doing the work. He is made responsible for courses of study, for textbooks, for supplies, for the quality of teachers employed, for the character of supervision, for the attendance of pupils, for medical inspection and supervision, for equipment, for constructing and maintaining the most serviceable kinds of buildings, for equipping buildings and grounds in ways most effective for the training, etc. Since these labors are very diversified, he is to be given officials of diverse qualifications, experience, and functions. When

the newly adopted administrative organization has been completed and the officials appointed, it will be squarely patterned upon efficient business organization. It will be thoroughly practical and business-like. In general outline of organization Denver now stands in the very front rank of American cities.

The new organization is clearly designed upon the principle that **the training of the children** is to be the central purpose in the control of everything involved. It recognizes the Unity of Ends, and therefore the need of Unity in the Control of the Means.

### **Weaknesses in the Work.**

, There is no need here to discuss the details of the administrative and supervisory labors of the superintendent and his staff of assistants. The reports on most of the other topics relate to those labors. Here it is desirable only to summarize in order to point out certain ways in which the administrative organization needs to be further developed and strengthened.

In the chapters dealing with instruction, while we shall point to much excellent work that is going on, we shall also have to point to many instructional weaknesses that are common throughout the system. Here are a few of them:

1. Very many teachers and principals have not sufficiently defined in their own minds the purposes which should control in their work. In far too many cases they are merely mechanically turning the wheels of the educational machine in the ways that they have learned largely through tradition without knowing exactly what products they are expected to turn out, or whether their labors are actually securing a sufficient measure of those products.

2. While many teachers are employing excellent methods, just as many are employing poor methods, with the majority somewhere between these two extremes with a mixed record. Too often principals are not bringing methods up to a proper degree of efficiency.

3. While many teachers are able to get all of their pupils to exert themselves sufficiently, in very many cases pupils are left relatively passive. Many teachers fail to get sufficient effort out of the pupils and for a sufficient length of time. Some teachers fail greatly, with resulting large loss of time and money. The majority of teachers, however, are to be found somewhere between the two extremes mentioned, with a good record in some subjects and a deficient record in other subjects. And where teachers continue deficient month after month, principals are deficient.

4. Many teachers and principals fail to take full opportunity of the educational means that are placed at their disposal; or they make wrong use of those means. Even more frequently, desirable educational materials are not at hand.

5. Many teachers fail to distribute their time or that of the pupils in economical ways. And principals often permit the maladjustments to continue.

### **The Elimination of Weaknesses.**

While most or all teachers have their strong points, it is none the less true that most teachers have their weak points. As we shall show in detail in the report on the instruction, weaknesses of certain kinds are common and widespread. Now these weaknesses are not to be got rid of in the way attempted last summer by dismissing teachers wholesale. Most have one or another of these weaknesses. Too many would, therefore, have to be dropped. Those who were brought in to fill their places would possess the same kinds of shortcomings, and probably in still greater degree. A city that treats its teaching corps inconsiderately cannot flatter itself that good teachers will come to fill the places of those dismissed. Not only will good teachers not come under such conditions, but those who are already within the system will go as occasion offers to other cities. Strong teachers at the present time can always find places easily because the demand for that type greatly exceeds the supply. The best teachers are gravitating to those cities where considerations of justice are most in evidence.

Weaknesses are to be eliminated not by the impossible method of dismissing teachers, but by the sound and practicable method of supplying that constructive educational leadership needed for helping all teachers in the service to discover their weak points, and at the same time to discover the means of overcoming them. The way to get rid of weak teachers is to take them in hand and make them strong. It will work in nearly every case. If there are cases in which it will not work, these cannot be found and known until the plan has been tried. Occasionally there will be found teachers whose personalities are such that they cannot be made into good teachers for any position within the system. Considering the fact that a lay board has until recently both certificated and nominated teachers in Denver, it would not be surprising if there were some such teachers in the Denver schools. But except in occasional instances, they cannot safely be located until a constructive program of remedying the weaknesses in the teaching

corps has been brought to bear upon them for a sufficient length of time to prove the obduracy of their weaknesses.

Now, who is to bring the teachers up to a high level of efficiency? Evidently the building principals. They are appointed for professional leadership, stimulation, advice, and improvement of the teachers within their buildings. The principal of one of the buildings in which the best work is being done made the remark, however, that he was earning the salary of a principal for about ten per cent of his time, and earning the salary of a clerk for about ninety per cent of his time. There are numerous routine duties about a building of considerable size that have to be taken care of or everything gets into a tangle. To employ \$2,000 people and upwards, to take care of matters that could be just as well taken care of by \$1,000 teacher-clerks is evidently very uneconomical; but this money loss is not the large loss. The chief waste results from the inefficiency in the instruction in all of the classrooms in the buildings due to the lack of vigorous, stimulating, enlightened leadership on the part of the principals. This waste of money, waste of the children's opportunity, and this inefficiency in the work of the system, are things that no city can afford. Principals should be at once liberated from duties that can be performed by clerks, and made responsible for educational leadership.

If anyone has any doubts as to whether the principals need their full time for carrying on their labors, let them read through the various sections of the report that relate to the instruction, and note the large number of problems that have to be dealt with and the tremendous complexity of the majority of those problems. One reason for going so fully into detail in the discussion of those sections is to indicate the need of liberating the principals from routine duties in order that they may lead in important professional matters that now have largely to be neglected.

Leadership in remedying deficiencies is also to be supplied in another way. In the sections on instruction we have shown that in the case of large numbers of problems there are teachers within the Denver system who have already mastered the difficulties, and who really are in a position to help the other teachers of the city system to find themselves. The administrative system needs to be organized in such way that the information and ability possessed by such superior teachers can be released and utilized for promoting the welfare of the entire city system. The powers of the capable, intelligent teachers should be fully used, and not neglected by confining their labors merely to the classroom to which they are assigned.

### **The Need of Permanence.**

If there is to be this educational leadership and this energizing of the work of teachers, then both teachers and principals must feel that they are building for permanent improvement; and that tenure and all personal adjustments are to be based solely upon that improvement. They must know with absolute assurance that fourteen teachers rated by principals an average of A, the highest mark, and thirty-five teachers rated B, which is also high, cannot be dropped from the service or placed upon probation at the whim of the board of directors without reasons given, such as occurred in June of last year. If so many teachers with the ratings of A and B can be dropped in such a manner, then inducements are lacking for continuous effort on the part of the teachers. If permanent improvements are to be thrown out of the system in such an inconsiderate way, teachers discouragingly ask what is the use of making improvements. Principals are likewise discouraged, under the conditions, from strenuous effort. Under the circumstances, the best thing to do is to sit tight and not rock the boat; or, perhaps, it may be to weave a basis of tenure of a political or personal kind. Where merit is not the thing that counts, then teachers must either find some other way of getting a hold upon the situation or go elsewhere. Under the circumstances they have to let merit and improvement go by the board. When it does not count, then it is made valueless as a means of tenure. Action of the sort referred to spells calamity for any system of improving teachers and of ridding the city of teaching weakness such as we have recommended. When elimination from the system threatens to be the reward of any teacher within the system, whatever the quality of the work, it will be impossible to bring general efficiency into the work.

### **Principals Need Assistance.**

It may be said that the building principals are very unequally equipped for the educational leadership suggested in this report. Many are well informed, it is true, as to current developments and practices in the field of education, and they are introducing valuable improvements wherever possible. It is very difficult, however, to keep informed as to these many needed developments. The information is scattered and difficult of access. When found, it is so often fragmentary and not easily understood. Principals have been busy for years past with the multitudinous affairs of their buildings, and have lacked the time and the surplus strength needed for keeping informed as to the valuable and desirable developments in education. On the side of



personality and possibility, Denver has on the whole a good corps of principals. In a few cases only ought the principal to be retired or to be given charge of the purely routine duties of a building, while a neighboring principal takes care of the instructional supervision of that building. While a few such adjustments seem desirable, in general the building principals have the necessary capacity and the proper personality for carrying out the program of leadership and stimulation that should be inaugurated and developed.

But for reasons pointed out, the building principals are greatly in need of help. Those trying to keep abreast of current movements can unaided be successful only in part. With the various things that they have to do, it is a physical and intellectual impossibility for them to study currently everything that needs to be studied. When the most active ones cannot help falling behind, naturally we shall expect to find the main body of the principals very considerably behind in their information and in their general vision of things that ought to be done. And a few are rather far behind.

Suppose now the routine duties were taken off the principals, and they were asked to energize and perfect the training in each of the various subjects in their buildings. They would find themselves very unequally equipped for undertaking the task. Most would find themselves inadequately equipped; many would not know where to turn. Their work might well range from excellent to poor, with more of it of only average quality. Average is not good enough.

Principals cannot be expected to work out these things alone. It would take too long. Most would work in partial ways, and they would too often arrive at different goals. They are not trained in the methods of research, or for organizing facts after they are found.

Just as the city needs to furnish personal leadership and stimulation for the teachers, so it also needs to furnish personal leadership and stimulation for the building principals. This is already furnished in large part by the city superintendent and the special supervisors of his staff. The city superintendent, however, has the general task of coordinating all of the labors of all of the departments of the entire organization. When one considers the nature of the work that he must do in connection with the board of directors, with the community in general, and in the general coordination of the various departments involved in a school organization employing 1,250 different individuals, it is very clear that the superintendent acting alone finds it physically impossible to furnish all of the necessary detailed leadership in the training of the principals. Rightly to do the work he would have to keep in constant contact with all of the principals' problems as they train

their teachers for the detailed labors involved in improving the work in arithmetic, reading, spelling, geography, history, grammar, composition, civics, music, drawing, manual training, domestic science, nature study, physical training, foreign languages, and all of the other detailed studies that have to be carried on within the classrooms.

### **Need of Assistant Superintendents.**

The superintendent will furnish some of this leadership as it relates to the detailed work of the system. But in general in a city of the size of Denver whenever the superintendent of schools gets too far involved in the systematic development and direction of the details of work in some portion of the field, it almost necessarily compels him to lose sight of and neglect some of the vital matters of general coordination. To keep the general balance of this large and complicated educational machine running true in all of its parts is a task large enough for the strongest of men, and important enough for all of his labors. Such careful and harmonious coordination of all of the factors entering into the work is a vital necessity for efficiency on the part of every portion of the organization. He needs subordinates to take care of all detailed labors.

And yet this central office in coordinating everything must lead in everything. The superintendent himself must furnish the general leadership, but he must be able to delegate the details of it to others. In the department of instruction this he now does in part as he works through his supervisors of special subjects in reaching the work of principals and teachers in the different buildings. But in the case of the majority of the subjects, there are no special supervisors. The situation demands the employment of about two assistant superintendents whose function will be to build out the personality of the superintendent, so to speak, so that he may through these assistant superintendents provide that leadership and stimulation needed at the present moment by the various building principals of the city; and needed in part even by the supervisors of special subjects. In recommending two assistant superintendents we are keeping in mind the usual practice of cities of the size of Denver. Reference to the report of the United States Commissioner of Education will show that a city like Portland, Ore., which does not differ greatly in size from Denver, has four assistant superintendents; Seattle has three; Indianapolis, three; and so on. If cities of the class of Denver need three or four assistant superintendents, then it would appear that two would not be an excessive number for Denver.

With an annual budget of \$1,500,000, inefficiency of the work within the classrooms is very expensive. Inefficiency, however, within the system is very frequent. It is not the rule, let us say, but it is very common. Let us say that inefficiency in the work brings it down only one-fifteenth below what is easily possible. Even admitting thus generously that fourteen--fifteenths of the work is getting full results, then in that case the annual waste is around \$100,000. But the waste is larger than one-fifteenth. Rarely is it because of the quality of the teacher or of the principals on the side of their general training, capacities and aptitudes. In general, it is because the system has never been organized for efficient accomplishment. All of the factors have been held too loosely in the hands of lay committees. The factors have not been knit up into a coherent system. The thing needed is that organization and leadership that will vitalize everything and everybody within the school system, and thus eliminate the slackness, the inequality, and the inefficiency. Qualified assistant superintendents in charge of instruction will pay their way many times over.

It is far easier to recommend such men and to vote money for their salaries than it is to secure them. The demand for strong men of sane and balanced educational vision greatly exceeds the supply. As the school authorities cast about for such men, they will find on the one hand many capable men of long and successful administrative experience, but who find themselves too deeply in the ruts of tradition to take up the kind of leadership needed now in Denver. On the other hand, it is possible to find many men, generally younger and less experienced, who are filled with the enthusiastic visions of educational progress, but who lack the restraining hand of practical experience. In their enthusiasm for the new, they too often lose their sense of values for the old, which, after all, has generally been proven by experience to be a thing of large value. Not sufficiently valuing past experience, they wish too often to break with the past and to start too many things over again. To find a man who has the vision of the things that may be, a man who is not held in the ruts of tradition, and who yet can look sanely over the whole field, and who can place just valuations equally upon the new and the old—this is very difficult. Such men are rare. They cannot be secured cheaply. But this is the type of man that Denver needs now to find and employ at whatever price it is necessary to pay, for its assistant superintendents.

Another reason for employing assistant superintendents in charge of instruction arises in connection with the inspectorial functions of the board of directors. Just as the assistant superintendent in charge of business affairs must keep a current account of all properties and mon-



eyes so that the board can at any time know just how each thing is going, so the assistant superintendents in charge of instruction need to keep a current accounting of each aspect of the instruction so that the board can at any moment see for their inspectorial supervision the current status of instructional affairs. They need to keep these current efficiency studies for the purpose of their own work. They must know with considerable precision just what is going on in all parts of the work of the system, through channels of information not now developed, in order to know where rightly to direct their own efforts. The information gathered for their own labors can then be placed at the disposal of the board of directors for their inspectorial supervision. Occasionally, but only occasionally, the board of directors will have this instructional accounting audited by some outside instructional expert, just as they have their financial accounts occasionally audited by some outside expert financial accountant or auditor. The details of these matters can be more profitably discussed in other sections of this report.

### **The Assistant Superintendent in Charge of Business Affairs.**

The so-called business affairs of the district relate to the material aspects of instruction. These material matters have to be adjusted carefully to the instructional needs. They are the tools of instruction; or they provide the surrounding conditions of instruction. They may be very well or very poorly adapted to the training needs. They will not be well adapted unless they are under the control of those who best know instruction, and who are responsible for the instruction. Since the material aspects are but a portion of every total educational situation, the department having to do with the management of material affairs needs to be a portion of the total educational organization. To place these matters outside of the educational organization in the hands of a business manager coordinate with the superintendent is to divide the factors of instruction between two departments while the responsibility for securing educational results is placed upon but one of them. It is to place the control of the factors of instruction into the hands of two men, one of whom is trained and experienced in the matters of instruction, and the other of whom under such organization is almost always untrained and inexperienced in the detailed work of the schools.

Denver has chosen the only proper arrangement. The assistant superintendent in charge of business affairs is made directly responsible to the superintendent. As provided in the new by-laws, the city superintendent through this assistant superintendent has charge of the

construction, operation and maintenance of buildings and equipment, the maintenance of grounds, the purchase, storage and distribution of supplies and all other material equipment, and has general charge of all school property belonging to the district. The superintendent and the assistant superintendent in charge of business affairs have also sole power of nomination of all employees of this department. The arrangement provided for in the new by-laws of the board can be commended in the highest terms.

The board needs now to employ an assistant superintendent in charge of business affairs, as recommended and nominated by the superintendent. Since the work of this assistant superintendent must in its every decision look squarely toward effectiveness in the conditions of instruction, he should be both a school man and a business man. Even though it may not be the usual rule, there are many school men who are excellent business men. On the other hand, it is difficult to find a business man who is at the same time a good school man. The assistant superintendent in charge of business affairs ought, therefore, to be taken from the ranks of the school department. There are several men of very superior educational and business qualifications within the Denver school system.

This recommendation could be reinforced by the presentation of examples of most glaring mismanagement in the purchase of supplies and equipment for the district, when this was done by executive committees of the board. But now that the board has repudiated the method, there is no need of opening up the past. The thing to be done is to forget past ways, **and then use right methods for the future.**

Detailed discussion of the labors of this sub-department is presented in another section of the report of the survey.

### **The Placement of Certain Departments.**

Certain of the departments that belong within a well-rounded administrative organization are not yet properly placed. The attendance department should be directly responsible to the superintendent of instruction. The organization that does the work of instruction is the one that should bear the responsibility for bringing the children into school for the instruction, and for keeping them in regular attendance. The attendance department is at present so well managed, the chief attendance officer is so thoroughly competent, and so completely takes the educational point of view, that no immediate reasons may appear for this change in the form of organization. But the superintendent's large task is the coordination of all of the agencies concerned. He cannot coordinate agencies that lie outside of the regular administra-

tive organization. He is not in a position to see that they receive proper financial support; that political appointees are kept out of the subordinate positions, etc. He is not in a position to coordinate the activities of the attendance department with those of the vocational guidance agencies in the public schools in the interest of children arriving at an age to leave the public schools.

The school census work which now is placed by law in the hands of the secretary should, when the city draws up a new school charter, be placed with the attendance department. Those whose duty it is to study the location of the children of the city throughout the entire year are the ones best in position to supervise the taking of the census, and to use the returns for their own attendance purposes, as well as for the usual financial purposes of the enumeration.

The department of medical inspection, as it is usually called, should be taken out of the attendance department and given the dignity of a full department. In so important a city as Denver there ought to be at the head of the department a mature, experienced physician, employed for his full time. Taking the usual practice of cities—not the best practice, but average practice in cities where they have tried to develop medical inspection—there ought to be one full-time physician employed for about 10,000 children enrolled in the public schools; or an equivalent in part-time physicians. In Denver this would mean that there ought to be three or four full-time physicians, instead of only one, as at present; or an equivalent in part-time physicians.

It is a usual custom of cities—though much below the best custom—to employ one school nurse for her full time for each 5,000 children. This would mean that in Denver there ought to be employed about six or seven school nurses, instead of the solitary nurse now employed merely as an assistant in the dental clinic.

On the side of dental care, the city has gone rather farther than in the case of the medical, since there is not only dental inspection, but also follow-up work and dental treatment. The beginning made is excellent. It needs further expansion.

Very common also are troubles of eye, ear, nose and throat. A specialist in this field could be of very great service to the children. Every hundred children saved from repeating a grade means a saving of \$5,000 each year to the school system. The saving that would result from the labors of such a specialist would pay the costs.

The practical judgment of other cities shows the need of development of the medical department. Whether one considers western cities, or cities of the population class of Denver, it is clear that the work is undeveloped.

TABLE II.

**Expenditure for School Medical Work Per 100 Pupils. Figures Are For 1914-15 for Denver, and For 1913-14 of the Other Cities, as Reported by the U. S. Commissioner of Education:**

Per 100 pupils		Per 100 pupils	
San Diego .....	\$71	Oakland .....	62
Oakland .....	62	Minneapolis .....	57
Los Angeles .....	53	Jersey City .....	48
Sacramento .....	41	Toledo .....	38
Berkeley .....	31	Atlanta .....	36
Spokane .....	25	St. Paul .....	36
San Jose .....	23	Seattle .....	22
Seattle .....	22	Columbus .....	18
<b>DENVER</b> .....	7	Worcester .....	18
Tacoma .....	5	Washington .....	14
Salt Lake City .....	2	<b>DENVER</b> .....	7

In the absence of sufficient effort within the school system, much highly commendable work is being done by the municipal department of health. It is indeed surprising to find efforts made by individual members of the board of directors to obstruct and prevent such beneficent labors, which are done at no cost to the district. It is difficult to believe that this attitude can be representative of the wishes of the community.

### **The Placement of Functions.**

If the charge is made that the superintendent has enough to do without certain of these added responsibilities, the question arises: Who else is there that has so little to do that he has the necessary time? It certainly is not the board of directors. We have indicated a program of legislative and inspectorial accomplishment for the board that is so large that they cannot possibly carry it through unaided. After giving all the administration over to the superintendent, their task is still so large that the superintendent and his staff will always have to assist greatly in even the legislative and inspectorial labors.

But even more pertinent to the question, it can be said with assurance that the size of the job has nothing to do with the right placement of it, whether with board or superintendent. The size of the job is related not to its placement, but to the number of men to be employed for doing the work.

### **Appointment, Assignment, and Tenure.**

In the recently adopted by-laws, in placing responsibility for the nomination, assignment, and transfer of employees with the superin-

tendent and his major assistants, the board has but followed ordinary good business methods. In carrying out the policy, the board will studiously and conscientiously turn a deaf ear to all applications for positions within the administrative organization. Applications reaching them will be passed on to the superintendent without recommendation.

**If the board is unable to employ the method of passing judgment upon the superintendent's recommendations as a means of securing a high grade teaching and supervisory corps, then it will clearly be unable itself to perform the double task of making nominations and judging of the correctness of its own nominations.**

The board as a board is interested only in getting things done. It is a matter of no educational moment to the board who does the work so long as it is well done and economically done. The superintendent alone—with its staff—knows the special educational problems to be found at each of the buildings. He and his major assistants are alone in a position to select helpers whose qualifications are as accurately fitted to the needs of the work as possible.

**Selecting teachers, principals, engineers, supervisors, etc., exactly qualified for doing the work is a large factor in the getting things done for which responsibility is placed upon the superintendent by the board.**

As the by-laws now stand, there is a very serious weakness, which ought to be remedied at the first opportunity. The tenure of teachers, principals, janitors, engineers, etc., is not made indefinite, as it ought to be, after a reasonable trial period. Their appointment must now be reaffirmed each year. While the superintendent will renominate all satisfactory employees and all others who are making satisfactory progress in their efforts to attain efficiency, the board in passing upon these nominations is free each year to refuse continuance in service of any teacher, principal, janitor, engineer, or other employee, whatever the quality of the service rendered.

The board should have no more power to initiate dismissal than it has to initiate appointment. The power of annual veto of the appointment of employees who have satisfactorily served their trial periods, should now be given up by the board voluntarily; and when a new school charter is framed, this power should be definitely withheld from the board. Using the veto of nominations as initiative in dismissing teachers is threatened at the present moment by half of the deadlocked school board. From action of this kind, last summer, the morale of the schools is already seriously undermined, the whole teaching corps is in a state of fear inimical to good work in an organization so sensitive to evil influences as a school system. The Denver school system is not in a position to withstand such onslaughts for long.



The board of directors should immediately pass another by-law providing for automatic renewal of all teachers' contracts after having served a trial period of one year, so long as such renewal is recommended by the superintendent.

The board of directors should also pass a by-law placing all initiative for the dismissal of any employee of the administrative organization in the hands of the superintendent.

When the objection is raised, as it has been raised, that these recommendations are presented by survey specialists merely because of personal relations with the present superintendent, principals and teaching corps, we have two things to say:

(1) The educational survey specialist who betrays the principles of good management in the interest of personal relationships commits professional suicide. These things are set down in black and white in terms as unmistakable as possible; and they go to all the profession. If the specialist is willfully wrong, or if he is often wrong for any reason, he has no future in the profession.

(2) The opposition can test the general validity of these recommendations by sending this document to any specialist in school administration in the United States, with a request for his independent unbiased judgment. We earnestly and urgently recommend upon all honest doubters whose only interest is the welfare of Denver and its schools that this be done.

### **Examination and Certification.**

The certification of teachers is the first step in appointment. It is simply the preparation of a list of potential appointees from whom to choose the actual appointees. Those responsible for initiative in the actual appointments are the ones, and the only ones, who should be responsible for the list of potential appointees.

The board has done well in its recently passed by-laws to delegate this function to the superintendent. When a new charter is framed, this power should be legally guaranteed to the superintendent. It is inconceivable that a legislature which placed the functions of examination and certification of rural and village teachers in the hands of professionally trained county superintendents, ever expected to lay school board in a first-class district to exercise these functions directly any more than it expected such board to do the teaching itself. The legislature evidently expected the board to delegate this function.

### **Retirement Provisions.**

The district is fortunate in having a teachers' retirement plan that is drawn on good lines. Its maximum provisions are moderately generous for single teachers; but inadequate for teachers having others dependent upon them.

Initiative for recommending retirement should be placed definitely with the superintendent. He and his staff alone can know when failing teachers have reached the point where their services are insufficiently profitable in the work.

### **Tenure of the Superintendent.**

No department of human affairs has so complicated a set of labors as a large city school organization. The factors are innumerable, intangible and many of them very difficult of access. When the Board of Directors chooses a superintendent to develop and put into execution the general policies decided upon, they must not only put everything that he needs at his disposal, but they must give him time for working them out. It requires a good while to become acquainted with the special situation within a city, and merely to discover all of the factors that have to be controlled in developing these policies. Then it takes a much longer time to get that hold upon the situation which enables the superintendent and his large staff of assistants, principals and teachers to obtain secure control over each of the factors. When superintendent and the other school people have got this secure control over affairs, and are effectively putting into execution the policies demanded by the board, as proven by the inspectorial examination by the board, then the one thing above all things that the board cannot afford to do is to let the superintendent release his hold upon the situation. A bank, a big department store, or a railroad cannot afford to change its managerial head every three years. They cannot hope to have good management if they must begin everything over again so frequently. The direction of a school organization is a more difficult and a more delicate task than the direction of any one of the matters named. Even more than those, it requires continuity and consistency of administrative policy.

This is not said merely by way of furthering the individual interests of the present superintendent. He has proven his capacity for the management of large affairs. Since the demand for men of this type for the superintendencies of the country exceeds the supply, like a former superintendent whom Denver did not sufficiently value, but

who was called to larger labors elsewhere, the present incumbent is not in need of any such recommendation by way of furthering his personal interests.

The recommendation is made solely in the interests of good management.

### **Officials Not Under the Superintendent.**

In performing its legislative and inspectorial labors, the Board will require the assistance of certain officials in addition to that rendered by the members of the administrative organization. These individuals are the secretary, the treasurer, the attorney, and others occasionally employed for short periods, such as an auditor, an architect, or other outside efficiency expert to assist them in checking up the work of the administrative system. Practically all of these officials are assistants to the board in their performance of its inspectorial functions. In part, they are employed to assist the board in its legislation. This is particularly true of the attorney and the secretary. In part, also, they perform administrative labors; but when performing such labors, they are simply acting as the executive agents of the board in its labors of legislation and inspection. They are in no wise members of the central administrative organization at the head of which is the superintendent.

The duties of these officials are in the main sufficiently obvious, and require no discussion. Just a word ought to be said by way of showing the possibilities of further developing the work in the office of the secretary. He is mainly an executive agent of the board in its labors of legislation and inspection. As such among other things, he bears responsibility for the labors of assembling and organizing facts to be used in the work.

The superintendent's office is also engaged in gathering the same facts for purposes of administration. It is undesirable to duplicate the labors, except where the work of the one is to serve as a check upon the work of the other. But even for this latter purpose, duplicate labor is not usually necessary. If one office staff is doing the work, but supervised on the one hand by the superintendent and assistant superintendents and upon the other by the secretary, each can see that one set of labors gathers all the facts needed for both offices.

### **The Need of an Administration Building.**

Under the very best of conditions it is difficult to coordinate the various elements of a complicated city school organization, and to keep



them permanently coordinated and adjusted to each other. Since the efficiency of the entire organization, however, depends largely upon such coordination, every desirable facility should be provided. It is highly desirable that the superintendent should have, within the building where his offices are located, the offices also of the assistant superintendents in charge of instruction; the assistant superintendent in charge of business affairs; each of the supervisors of special departments; the chief attendance officer; the chief medical supervisor; the supervising engineer; the clerical staff having to do with financial and instructional accounting, etc., etc. At present the offices of these various people are scattered about in a number of buildings at a considerable distance from each other. Under such conditions it is practically impossible to coordinate the labors of the organization. This single fact renders the labors of the city superintendent doubly difficult. Perhaps it would be more accurate to say that it makes efficient labor impossible. The city is greatly in need of an administration building that will permit the centralization of all of these various offices.

But since the administrative organization is but the executive arm of the board of directors, the needs of coordination require also that within the same building should be found the offices of the board of directors and of the secretary.

The school building on Broadway near the city civic center offers an excellent location for an administration building.

## INSPECTORIAL FUNCTIONS

After legislation comes administration; and in the wake of administration comes inspection by those who have legislated in order to see whether their legislative decrees have been followed and the intended results secured.

### Inspection of Finance.

One of the most vital legislative activities of the board is the provision of funds for the support of the work. This provision, however, will not be a large general sum, but a series of special sums making up the budget, each designed to provide for a special aspect of the work for the year. The executive officials are then charged with three things:

1. Each budgetary item must be made to cover the full year's expenditures for that particular account.
2. The expenditures are to be distributed over the year, so that each month will have its proper share. In the instruction department this means an approximately equal distribution over the various months of the school year; in the repairs department, the larger portion would be distributed over those months most favorable for making repairs, etc.
3. Each dollar expended is to be made to secure as large returns as possible.

The administrative labors of investing the money in the various specific items in ways intended by the board in its budgetary legislation should be performed by the executive agents of the board. The form of accounting, however, should be of such a sort that the board can currently know whether the expenditures are conforming to the three requirements mentioned above. At the end of each month the board should be able to see the amounts of each budgetary item expended during that month. The monthly financial report ought to show the total expenditures of the year down to that date. It ought to show the unexpended balance for each of the items. For purposes of comparison with previous years it would be well to have the various figures reduced to percentages. It can then be seen whether the progress of expenditures for any year follows the usual progress of expenditure. With these facts before them, the board, like the directors of any other business corporation, can know whether the expenditures are being

properly held within the limits of the budget. If expenditures of any items are so great that the appropriation threatens to be exhausted before the year is ended, the fact instantly comes to the surface in such report; and the board can act by way of righting matters. If, on the other hand, the executives are neglecting some feature of the work, the accumulation of an unexpended amount reveals the neglect; and the board can act by way of remedying the neglect. This accumulation may often mean increased economy without any sacrifice of the work. It is good for the board to have a system that will clearly reveal such newly discovered opportunities for economy.

For inspectorial determination as to whether each dollar expended is being made to secure as large returns as possible, the board will need to have a different kind of facts. They must know the standard price that is to be paid and is being paid for each thing purchased, whether labor or commodity, by their executive agents. The salary list and the monthly pay-roll, the latter drawn up by the assistant superintendent in charge of business affairs and audited by the board's secretary, will show the placement of the larger portion of the monthly budgetary expenditure. Having, then, standard specifications for all commodities used in the schools, together with standard samples, having modes of accounting and inspection recommended in another portion of this report, it is possible for the board of directors to know currently that every dollar expended secures the intended return.

**If the board of directors cannot employ this plan of checking up the efficiency of expenditures on the part of its expert executive agents, then it cannot employ any such plan of checking up the efficiency of the expenditures if these are directed by school board committees.**

Whether the inspectorial labors are applied to themselves or applied to somebody else, the methods must be the same. Through such inspection the board can hold all expenditure of the people's money strictly within the channels intended in their legislation. Neither they nor the people of Denver want anything other than this. The plan permits them to control expenditures completely, and yet to secure the good judgment and the efficient services of men specially trained and experienced in the work.

So far as possible, expenditures for each item will be reduced to unit-costs and comparisons made:

1. Building will be compared with building.
2. Each building will be compared with its own past record over a series of years.

3. Denver practice will be compared with that of other cities of similar size and character.

### Inspection of Fuel Costs.

Let us take, for example, **cost of fuel**. While buildings differ in size, classrooms are more or less standardized. We can therefore take as a unit for comparison the cost of fuel per classroom. Table III shows the results by buildings for the year 1913-1914:

TABLE III.

#### Cost of Fuel per Classroom, 1913-14.

Steele . . . . .	\$101	Lincoln . . . . .	\$ 52
Grant . . . . .	96	Columbine . . . . .	50
Gove . . . . .	89	Gilpin . . . . .	50
Milton . . . . .	89	Swansea . . . . .	48
East High . . . . .	83	Boulevard . . . . .	48
North High . . . . .	80	Corona . . . . .	47
Garfield . . . . .	78	Elmwood . . . . .	47
Sheridan . . . . .	76	Sherman . . . . .	46
Vassar . . . . .	70	Central . . . . .	45
Berkeley . . . . .	65	Alcott . . . . .	44
Bryant . . . . .	65	Webster . . . . .	44
Manual High . . . . .	64	Villa Park . . . . .	43
Valverde . . . . .	63	Smedley . . . . .	42
Myrtle Hill . . . . .	62	Whittier . . . . .	42
West High . . . . .	\$ 58	Columbian . . . . .	\$ 42
Franklin . . . . .	58	Garden Place . . . . .	40
McKinley . . . . .	57	Ashland . . . . .	39
University Park . . . . .	57	Edison . . . . .	39
Park Hill . . . . .	57	Byers . . . . .	39
Clayton . . . . .	55	24th Street . . . . .	37
Ironton . . . . .	55	Wyman . . . . .	35
Montclair . . . . .	55	Hyde Park . . . . .	35
Washington . . . . .	55	Ebert . . . . .	33
Fairmont . . . . .	55	Mitchell . . . . .	33
Emerson . . . . .	54	Bromwell . . . . .	28
Evans . . . . .	54	Cheltenham . . . . .	28
Logan . . . . .	53		

The average expenditure for fuel per classroom for the year 1913-14 was about 54 dollars. Whether this represented good management cannot be known from facts at hand. Fifty percent of the schools spent per classroom a sum ranging from 42 dollars to 62 dollars, which does not greatly differ from this average. But what is to be said for the management of the fuel in buildings where the cost per classroom was far higher than the average? Nearly twice as much as the average

was spent per classroom upon the Steele; and nearly four times as much for this building as upon those most economical of fuel. Coal per classroom at the Grant, the Gove, and the Milton, cost more than three times as much as at the Cheltenham and the Bromwell. Yet the rooms at these expensive schools are no larger, the term is no longer, the winter is not more severe. Either there was waste of fuel in the highly expensive buildings or there was bad ventilation and a lack of heat in the less expensive buildings. Either was bad management.

But was there lack of heat or lack of ventilation in the Cheltenham, the Bromwell, the Mitchell, and all the other buildings for which coal cost less than 40 dollars per classroom? If not, then these buildings showed what was, and perhaps is, possible in most of the buildings of the city. Suppose all buildings could do as well as the average of the eleven least expensive buildings, and could obtain their fuel at \$35 per classroom. That would have meant an expenditure for the year upon fuel, of \$31,010 instead of \$45,956, actually expended; a saving of nearly \$15,000.

If, on the other hand, it could be proven that only the dozen most expensive buildings had enough heat and ventilation at their average cost of 80 dollars per classroom, then the management was negligent in the case of the other forty schools upon which a lesser sum was invested. The board ought to have expended \$70,000 instead of the actual \$45,956.

Our only purpose is to turn over the facts so as to show how the board can use such facts in its inspectorial labors. The figures seem to indicate inadequate management; but now that the system has been reorganized there is no need to go into it except to show how such facts are to be used in preventing mismanagement in the future as the labors are placed in the hands of its experienced executive agents. It is evident that the board has not been doing its inspectorial work efficiently or such administrative management would not have been permitted to continue year after year. The difficulty arises largely from the fact that the board has been called upon to inspect its own efficiency. There is no evidence to indicate that the board ever examined into these comparative facts; no evidence that they ever saw these figures before they were presented in this report; or that they ever asked to see them.

This will not continue. Their assistant superintendent in charge of business affairs is to be put in charge of the fuel situation and is to use his best judgment by way of promoting fuel economy, and at the same time supplying proper heat and ventilation. He will report

periodically as to fuel costs per classroom in all of the buildings. Where high, he will be required to explain and to justify the excessive expenditures; or if this is not possible, to bring expenditures down. On the other hand, where they are excessively low, he will be required to explain and to justify the heating and ventilation in such buildings; or if unjustifiable, to bring these matters up to standard. If the low price can be justified, the board will ask him to study the situation in all other buildings by way of making general such methods of economy.

**The board can get better management by thus managing through legislation and inspection the labors of an expert, than by trying to do it directly themselves.**

If the board cannot secure good management through such legislation and inspection, as these apply to the labors of experts, there is no reason to suppose they can get good management when the legislation and inspection are to apply to itself as its own executive, or to its inexperienced executive committees. When facts are presented in proper fashion, a board can easily see maladjustments that require remedy. But they cannot usually know what to do by way of correcting the difficulty. In the case referred to, the assistant superintendent of business affairs, in conjunction with his expert supervising engineer, can locate the factors entering into fuel management; find just where the waste is; and eliminate it where it is really unnecessary. A board cannot be expected to be expert in this thing; and they cannot be expected to give the time necessary for keeping all of the factors carefully adjusted in all of the buildings. It is enough to select good strong men, and then to supervise them inspectorially.

### **Inspection of High School Instruction Costs.**

In the high schools, the board is investing annually in the purchase of certain quantities of instruction in English, mathematics, history, science, Latin, Greek, modern languages, drawing, commercial studies, etc. Is the board securing these things at a proper price?

Note the price paid for each 1,000 student-hours of Latin in the different high schools:

**TABLE IV.**

#### **Cost of 1,000 Student-Hours of Instruction in Latin.**

West Side High School.....	\$132
Manual Training High School.....	93
East Side High School.....	93
South Side High School.....	87
East Latin High School.....	82
North Side High School.....	62



The usual business man knows what is a proper market price for the things he has to buy in his business; and he declines to pay a price that varies too much from this market price. If the price is too high, he refuses to pay it, for the sake of economy; if too low, he is pretty certain that he would be getting inferior goods. This principle of good business management applies as fully in the purchase of Latin instruction as in the purchase of silver bullion, wheat, or steel rails.

If a perfectly good quality of Latin is being obtained at the North Side High, how are the prices paid at the other five high schools to be justified? If the North Side is not getting a good quality of work, how is the poor quality to be justified? The board in its inspectorial supervision will require a satisfactory answer to these questions; or it will require adjustments in the work that will save the financial waste if that is the trouble—as is most probable. Prices paid must not just **happen**, as seems to be shown by these figures. There should be prevision and rational control over the factors involved in the costs. What is possible in the well-managed North Side High, is possible for each of the other buildings. The board of directors as they have such facts placed before them year after year will see that the corrective adjustments are made and that they are continued year after year. Prices may change with conditions; but they ought to change in much the same way in all of the buildings.

It is interesting to observe that while the board is investing \$93 per 1,000 hours in Latin at the East Side High, it is investing \$322 for the same amount of Greek in the same high school. Greek may be valuable; but it is highly improbable that it is three and a half times as valuable as Latin, and five times as valuable as English or mathematics. The board is paying an inexcusable price. When Greek goes above \$100 or \$150, the board would do well to find a cheaper substitute and let students who must have Greek get it as they get their piano lessons—by employing private teachers.

Attention is called to this extravagant expenditure for the purpose of showing the indispensable need of inspectorial facts. The board has not had the facts before it. It has not known that such unjustifiable expenditure was being made. Naturally, it could not inspectorially condemn and demand readjustment on the part of its executives until it had the facts. There are countless leaks in the system for just this reason. In spending so much time upon administrative labors in the past, they failed to develop efficient inspectorial methods, with the result that management of the school system is loose and uneven in all its parts. The board will tighten up the system, not by trying



to do the work themselves, but by getting inspectorial facts with which to hold their executives responsible.

In order to show still further the need of such facts, let us present the costs of instruction per 1,000 hours for several other subjects in the various high schools.

TABLE V.

## Cost of Instruction Alone per 1,000 Student-Periods.

English		Mathematics		History	
East	\$65	South	\$79	Manual Tr.	\$73
North	59	East Latin	77	West	68
Manual Tr.	59	Manual Tr.	74	North	62
West	58	East	62	East	61
East Latin	55	West	59	East Latin	58
South	53	North	57	South	46
Science		Modern Languages		Drawing	
West	\$86	South	\$93	East	\$107
Manual Tr.	78	West	86	South	89
East	77	Manual Tr.	84	North	69
East Latin	76	East	81	West	57
North	66	East Latin	74	Manual Tr.	50
South	43	North	72		
Commercial		Normal Training		Greek	
Manual Tr.	\$81	East	\$110	East High	\$322
East	64	North	66		
West	43	West	62		
North	40	South	23		
South	35				

## Inspecting Cost of "General Supplies."

It is sometimes said that school systems are not managed; that **things just happen**. The figures given in all of these tables lend color to such a statement. In large measure at least, the business management has been simply drifting. The business has not been managed on the basis of definite standards. Table VI shows divergencies and discrepancies which could scarcely exist in a school system where expenditures were currently measured up against standards. The general supplies furnished the various buildings are much the same. The needs in the different buildings are much the same. The figures cover a five-year period, so they cannot relate in any case to any specially large consignment in any particular year to a particular building. The figures are supplied by a system of accounting that is the same for all buildings.

TABLE VI.

**Average Annual Cost of "General Supplies" Per 100 Pupils  
For the Five-Year Period, 1909-1914**

	Cost per 100 Pupils		Cost per 100 Pupils
Park Hill .....	\$25	Valverde .....	\$12
Univ. Park.....	24	Franklin .....	12
Villa Park.....	21	Alcott .....	12
Sheridan .....	20	Bromwell .....	12
Corona .....	19	Byers .....	11
Myrtle Hill.....	18	Mitchell .....	11
Berkeley .....	17	Smedley .....	11
Milton .....	17	Twenty-Fourth .....	11
Sherman .....	16	Lincoln .....	11
Grant .....	15	Ebert .....	11
Columbian .....	15	Whittier .....	11
McKinley .....	15	Clayton .....	11
Elmwood .....	14	Wyman .....	11
Montclair .....	14	Logan .....	10
Columbine .....	14	Gilpin .....	10
Vassar .....	13	Hyde Park.....	10
Fairview .....	13	Edison .....	10
Garfield .....	13	Swansea .....	10
Evans .....	13	Emerson .....	9
Boulevard .....	13	Bryant .....	9
Garden Place.....	13	Cheltenham .....	8
Fairmount .....	13	Central .....	7
Ashland .....	12	Washington .....	6
Webster .....	12		

The Park Hill School has consumed \$25 worth of general supplies per 100 pupils per year, while the Washington School was consuming \$6 per hundred pupils. Either the Park Hill School was oversupplied, or the Washington School was undersupplied. In one case or the other, and possibly in both, there is the possibility at least of inequitable management. When such figures are brought before the board for their inspectorial examination, they will require a satisfactory explanation before they will accept the condition at either of these schools.

When such a table as this is presented to the board for its examination, the presumption always is that conditions found in the large number of schools lying near the middle of the scale represent the general policy of the system. If the system is well managed, this must be the case. Supposing that the twelve or thirteen dollars expended upon the dozen schools at the middle of the scale represent the general policy of the board, they will want to know in considerable

detail why double this amount has been expended upon two of the schools in the list. They will equally demand an explanation of the fact that only about half enough has been expended upon two other schools in the list. If a study of the needs of the buildings has revealed the fact that an expenditure of twelve dollars is a minimum of desirable expenditure, the board will want to know of its administrative officials, why the small expenditure in a full dozen buildings does not represent neglect of the needs of the pupils in those buildings. On the other hand, if it is possible for a dozen buildings to get on with an expenditure of twelve or thirteen dollars, the question will naturally arise why a full dozen other schools require fifteen dollars and upwards.

In the legislation of the board, in its expression of general policy it wants to be exceedingly careful as to the standard set for expenditures of this type. The situation needs first to be carefully studied in all of its relations. But after careful statement of general policy as to minimum and maximum standards of expenditures for general supplies, the board should see, as these reports are laid before it annually, that only in rare cases do the figures fall below the minimum or rise above the maximum. In special instances occasionally this will be the case; but it will never be the case except when there is, at the same time, a satisfactory explanation for it.

The figures as given are as clear as possible a proof that the management from 1909 to 1914 has just let things happen. Let the board put their general policies into the hands of an assistant superintendent in charge of business affairs and let them demand that expenditures shall be kept between minimum and maximum figures set, then things in this department will no longer just happen. Business management will take the place of whim and chance and the other things that have often been in the saddle.

### **Inspection of Costs of "General Repairs."**

Until the exact facts are placed before them, a community usually believes that a lay committee on buildings are good business managers. Table VII shows the average annual cost of general repairs per classroom for the five-year period from 1909 to 1914. It is true that repairs on a building usually come more or less bunched; but when a five-year period is considered, this is pretty well evened out.

TABLE VII.

**Average Annual Cost of "General Repairs" Per Classroom  
For the Five-Year Period, 1909-1914.**

Cost per Classroom	Cost per Classroom
Sheridan .....\$82	Villa Park.....\$40
Emerson ..... 78	McKinley ..... 36
Fairmount ..... 77	Swansea ..... 35
Milton ..... 74	Twenty-Fourth Street..... 35
Logan ..... 66	Webster ..... 35
Berkeley ..... 60	Smedley ..... 34
Sherman ..... 59	Columbine ..... 34
Columbian ..... 58	Cheltenham ..... 32
Washington ..... 57	Boulevard ..... 31
Garden Place ..... 56	Byers ..... 30
Ashland ..... 54	Edison ..... 30
Ebert ..... 54	Elmwood ..... 30
Hyde Park..... 53	Clayton ..... 28
Wyman ..... 52	Whittier ..... 27
Franklin ..... 52	Alcott ..... 23
Vassar ..... 51	Bromwell ..... 22
Fairview ..... 48	Lincoln ..... 21
Grant ..... 48	Bryant ..... 21
University Park..... 47	Evans ..... 18
oMntclair ..... 45	Park Hill ..... 17
Gilpin ..... 43	Mitchell ..... 17
Myrtle Hill..... 42	Valverde ..... 13
Corona ..... 41	Central ..... 10
Garfield ..... 41	

The table shows that the average annual repairs upon ten buildings cost from \$56.00 to \$82.00 with an average of \$67.00 per classroom. At the other end of the scale there were another ten buildings upon which the repairs cost only \$10.00 to \$27.00 or an average of only \$19.00. The first ten buildings cost an average of three and one-half times as much as the lowest ten.

Naturally, there are very many factors entering in. All things being equal, an old building will require more repairs than a relatively new one. But an examination of the ten buildings upon which the least amount has been expended, reveals the presence of a number of old buildings; and among the more expensive buildings, there are some that are relatively new. It seems that the factor of the age of the building is not the principal one.

The figures appear to indicate that there has been a distinctly inequitable attention to the needs of the different buildings; or there has been imperfect bookkeeping; or there has been very unequal orig-

inal construction in the different buildings. None of these things are indications of good management.

In this matter of repairs it is not at present possible for the board to set up minimum and maximum standards of expenditure of the type referred to in the previous section. The buildings are too different in so many ways. It is possible, however, for the board to look upon an expenditure of \$30 to \$54 per year per classroom as being a reasonable expenditure as represented by the practice of the middle 50 per cent of the buildings. The board will then, in its inspectorial capacity, require an explanation for excess expenditures beyond \$54 per classroom. They will likewise demand an explanation for expenditures that fall below \$30. They can make very good use of both kinds of explanations. They can weed out waste and graft and inefficiency in the case of buildings which have been costing too much. They can prevent neglect and deterioration in the case of buildings where the evidence indicates neglect. Where buildings are kept in good repair year after year, and yet the annual cost per classroom is low, the board will discover that type of construction that is most economical in the matter of repairs. Such figures as these present a method of discovery of that type of construction to which the board should adhere.

It is impossible for a committee of the board on buildings to keep inconstant contact with the repair needs of all of the various buildings of the city so as to keep expenditures down where they tend to mount too high, and to keep expenditures up where there is a tendency to neglect. The board will require reports which present unit-costs. With these reports before them, they can discover the buildings that require attention. They can give orders to their executives to right conditions that are found to be undesirable. They can place in the hands of their executives the means necessary for righting conditions. And then they can legitimately demand results. These results will be shown in reports that come in at the end of each school year. In this way, the board will get things done by means of trained, experienced men instead of trying to do a type of work themselves for which they have neither the time or the qualifications.

### **Inspecting Costs of Repairs to Heating Plant and Plumbing.**

The city has invested in all kinds of heating plants, and in various kinds of plumbing arrangements. The maintenance of some of these is very much more expensive than the maintenance of others. A unit-cost study carried on over a series of years is a method of discovering the type of heating plant that appears to be most economical. Naturally there are many things to be taken into account. Quality of serv-

ice once being assured, economy of maintenance is then a major item. Table VIII shows the average annual cost per classroom for an entire five-year period for the repairs to the heating plant and the plumbing in the different buildings.

TABLE VIII.

Average Annual Cost Per Classroom For Five-Year Period, of  
"Repairs to Heating Plant and Plumbing."

Classroom Cost per	Cost per Classroom
University Park.....\$58	Bryant .....\$15
Gilpin ..... 49	Washington ..... 15
Ashland ..... 36	Montclair ..... 14
Sheridan ..... 35	Garden Place ..... 13
Grant ..... 33	Whittier ..... 13
Bromwell ..... 40	Central ..... 13
Elmwood ..... 24	Byers ..... 13
Emerson ..... 22	Franklin ..... 12
Park Hill..... 22	Berkeley ..... 11
Valverde ..... 22	Cheltenham ..... 11
Columbian ..... 18	Corona ..... 11
Smedley ..... 18	
	Webster ..... 11
Vassar ..... 18	Swasea ..... 11
Varfield ..... 17	Mitchell ..... 10
Clayton ..... 17	Hyde Park..... 10
Lincoln ..... 17	Fairview ..... 10
Alcott ..... 17	Wyman ..... 9
Twenty-Fourth Street..... 17	Ebert ..... 9
Milton ..... 16	Boulevard ..... 9
Sherman ..... 16	McKinley ..... 7
Columbine ..... 16	Myrtle Hill..... 6
Evans ..... 15	Logan ..... 6
Villa Park ..... 15	Edison ..... 6
Fairmount ..... 15	

As measured by the average of a long five-year period, the heating and plumbing plant at the University Park cost practically ten times as much per classroom unit as those found at the Edison, the Logan, the Myrtle Hill, and the McKinley. The dozen buildings costing least get on with an average expenditure per year of about \$9 per classroom. The dozen buildings costing most require an average annual expenditure of over \$30 per classroom or about three and one-half times as much. The middle 50 per cent of the buildings cost between \$11 and \$18 per classroom. This gives the board a very clear practical standard to employ in their inspectorial examination. They will try to find the things that are to be avoided as they inquire into the buildings that require an expenditure of more than \$18 or \$20. They will try to discover the improvements that are to be generally adopted



by examining into the buildings that require an annual expenditure of not over \$11 per classroom. They will not neglect quality of service; but if any building of the lowest dozen has a proper heating and plumbing plant that over a long series of years, can deliver proper service at the low cost, the method permits them to discover it and to discover the things that are to be made general throughout the buildings of the city.

The factors involved in this problem are of great complexity, and require the expert services of a trained engineer. After discovering the situation in these buildings at the extremes of the scale, the organization will put its trained and experienced supervising engineer to work to discover the things that require adjustment; and to make recommendations of things to be done. After giving to him the things that he needs for his work, they will of necessity have to leave all of the details to him. The board wants only results. It knows that the expert is best qualified for getting results. They give him the job; and then they check up the results. Only men lacking in even rudimentary business qualifications, if disinterested, will want to interfere in the details.

### **Inspection of the Instruction.**

We must begin our discussion here with a caution. Laymen in general do not claim, nor do they possess, the ability to judge on the basis of their usual casual information the detailed labors of a physician, mechanical engineer, architect, etc. The layman can usually judge of results in a general way, but not of detailed processes. Now education, when rightly done, involves more complicated procedure and more complicated information than any one of the fields mentioned. Yet the layman so often considers himself competent to pass judgment upon the detailed processes of the classroom. The greater such layman's assurance, however, the more certainly is he incompetent to exercise such judgment. Very many educational factors and influences are invisible to the eye of the layman. They were largely invisible to him when as a boy he secured under simpler conditions about the only educational experience that he has ever had. They are still largely invisible to him; and of many he is therefore unaware of their very existence. It can be confidently stated that the usual layman at the present time is not qualified for judgment as to detailed educational processes.

The layman ought to be pretty well informed as to the results that are to be secured as the outcome of the school work, for purposes of general social supervision. Whether one is on the school board or



is one of the large community whom the the school board serves, he ought to know in some detail what it is that the schools are expected to accomplish in the end; and he should be able to judge whether the schools are actually securing the results which they are paid to secure. One can say also with certainty that parents in general and even the community in general should have some understanding of the processes employed in the educational field in the education of their children. They should be able to judge not only whether the outcome is proper, but in some degree at least to judge whether the processes applied through years to their children appear to be the ones designed for best reaching the desired goals. But while these things ought to be generally understood in a well-regulated democracy, it must be confessed that the information of laymen as to both of these matters is too often at present vague, fragmentary, and unserviceable for adequate judgment. The board of directors cannot be excused, however, from its inspectorial responsibilities merely because of difficulties met with in performing them. The city cannot expect to receive the highest quality of educational service unless these inspectorial duties are adequately performed. No profession is more conscientious or more zealous than that of education. But teachers are human. They require the professional stimulation that comes from a consciousness that their labors are being observed and judged by those for whom they labor; and that they are to be held responsible for efficient service. They need, however, to feel that the observation is intelligent; that it is observation which will appreciate all excellencies in the work; and observation which will intelligently condemn shortcomings, but only shortcomings.

Having now presented these precautionary considerations, we can proceed with the statement that there are very many instructional matters that can be intelligently inspected by laymen. It is possible to develop systems of reports that will reveal the instructional situation in ways analogous to the financial method referred to in the preceding section. As a matter of fact the inspectional difficulties just alluded to relate rather to the difficulties of direct inspection by the layman when he goes into the classroom. If, however, the factors entering into the instructional situation are disentangled one from the other, and if then those factors are each set forth separately in carefully formulated reports and placed before the board of directors, it is possible to make clear the nature of the entire situation sufficiently for the board's labors. The board has not hitherto made any attempt to develop systematically its inspectorial powers and methods of procedure in any field, not even in the simple field of finance. Naturally, therefore, it

has not yet been developed for the more difficult field of instruction. It is needed in both. To illustrate what can be done, let us take up some of the instructional matters into which the board will want to make inspectorial examination. Our purpose here is to show methods.

Let us take, for example, the number of pupils assigned to each of the elementary teachers. With a budgetary appropriation designed to maintain classes with the present average of thirty-seven pupils per teacher, the question that arises is, Are the board's executives so classifying the pupils in the various schools that classes on the whole are numbering in the neighborhood of thirty-seven pupils to the teacher?

The actual situation in the city last November is shown in the accompanying table. The table presents regular classes only; it does not include any of the special classes, nor the kindergarten classes:

**TABLE IX.**  
**Number of Pupils Assigned to Elementary Teachers.**

Number of Children in the Class	Number of Classes	Number of Children in the Class	Number of Classes
Over 50 pupils.....	20 classes	32 pupils.....	27 classes
50 pupils.....	9 classes	31 pupils.....	24 classes
49 pupils.....	5 classes	30 pupils.....	28 classes
48 pupils.....	4 classes	29 pupils.....	19 classes
47 pupils.....	8 classes	28 pupils.....	18 classes
46 pupils.....	9 classes	27 pupils.....	7 classes
45 pupils.....	9 classes	26 pupils.....	8 classes
44 pupils.....	9 classes	25 pupils.....	8 classes
43 pupils.....	27 classes	24 pupils.....	10 classes
42 pupils.....	21 classes	23 pupils.....	2 classes
41 pupils.....	31 classes	22 pupils.....	3 classes
40 pupils.....	46 classes	21 pupils.....	2 classes
39 pupils.....	39 classes	20 pupils.....	1 class
38 pupils.....	35 classes	19 pupils.....	3 classes
37 pupils.....	42 classes	18 pupils.....	2 classes
36 pupils.....	35 classes	17 pupils.....	2 classes
35 pupils.....	37 classes	16 pupils.....	0 classes
34 pupils.....	26 classes	15 pupils.....	3 classes
33 pupils.....	36 classes		

The table shows that while the majority of teachers had classes ranging in size from thirty to forty-three pupils, twenty teachers in the system had over fifty pupils, and fifty-five classes had more than forty-five pupils. On the other hand, ten classes had fewer than twenty pupils, and eighty-eight classes fewer than thirty pupils. The board can see at a glance that the classification of pupils within the system has not been well managed. Some classes are altogether too large for educational efficiency, while others are altogether too small for financial economy. If the average of thirty-seven is the one to be decided upon in the budgetary appropriation, naturally it cannot be expected

that all classes in the system would number thirty-seven. The many factors entering in will necessitate classes as small as thirty, and in occasional instances even smaller. On the other hand, in congested regions classes will have to run, at least temporarily, much above thirty-seven pupils, with an occasional class larger than forty-five. But classes above forty-five or below thirty should be rare and should be explained on the basis of very unusual conditions. There certainly should not be 143 of them—nor even 43.

The superintendents and principals in making readjustment of these classifications must have control over the various factors entering in: the determination of the number of teachers to be placed in each building; the transfer of teachers from building to building so as to secure the most economical placement of the teachers of different qualifications; control over district boundaries, so that as far as possible in buildings where classes average too low the attendance can be increased by enlargement of the boundaries, and where conversely in congested districts boundaries can be contracted so as to diminish the average size of classes; the formation of special classes when these can be used for equalizing the size of classes within a building; assisting specially bright pupils to extra promotions from large classes into smaller ones; adjustments of course of study and of standards of promotion, so that in schools where the work is done under special difficulties the quantity of retardation will not be greater than in buildings in general; the placing of specially large classes with specially strong teachers, and conversely the placing of specially small classes with less capable teachers, etc. It will be observed that the factors to be controlled in making adjustments in size of class are very numerous. Such a table, however, as the one given, throws light upon the city's method of handling the various factors. The table permits a diagnosis of the situation. When such a scattered distribution meets the disapproval of the board of directors they can express their inspectorial disapproval of such a situation; instruct the superintendent and his assistants to remedy matters; and give the necessary power into their hands for so doing. It will be idle for them to disapprove and to instruct without giving the superintendent power over the factors involved in carrying out the instructions.

At the corresponding period of the following year the board should require from the superintendent a second table showing conditions after remedial adjustments have been under way for a sufficient time for securing at least partial results. If no improvement has been made, all of the factors having been placed under the control of the superintendent, then the board has clear proof of dereliction of duty.

If, on the other hand, improvement has been made, the extent of this improvement can be clearly visible to the board, and the ways in which it has been secured can be explained. The reasons why the improvement has not been greater can likewise be explained; and the legislation asked for that has been found to be necessary for securing still larger improvement.

For years past the board of directors has been requiring of the building principals monthly reports as to the number of pupils under each teacher in each of the buildings in the city system. These reports have been filed away and not much used for inspectorial purposes. They represent an appreciable amount of labor for the principals every month. This labor was paid for at a rather high rate; and then not greatly used. The figures were not tabulated in any such way as to permit their being used. Such figures cannot be used until they are all worked up into a single table, the whole of which can be seen at a single glance. When this is done, as in the table which we have presented, it becomes one of the best possible means of diagnosing a complicated situation. It serves as one of the best starting points for judgment as to things to be done by way of improving conditions.

### **Inspection of Failures.**

It is a serious thing for a child to fail to do a term's work in a term, and be thereby forced to go over the same term's work a second time. If he goes to the end of the course, each such failure extends his course by the length of one term. If he attends until only a certain age, then he misses as many terms of the upper grade work as he has had failures during his course. In either case there is serious loss to the child. In the former case, there is serious financial loss to the school city. For those repeaters who ultimately finish the course, the city has to furnish for every thirty-five or forty failures, an extra teacher, a classroom, fuel, janitor service, etc., that would have been saved if there had not been the forty failures. For the four terms of 1913-14-15, the average number of failures per term was almost exactly 2,500. If 1,000 of these represent pupils who ultimately finish the course—exact figures are not available—this represents the extra expense of twenty-five or thirty extra teachers with all the other attendant expenses, a total annually of something like \$40,000. Some of this is doubtless made necessary by conditions. Much of it is waste.

Failures are undesirable and expensive to all concerned. The board of directors will inspect reports relating to failures. For each term they need to have figures presented by buildings somewhat as they are presented in Table X.

**TABLE X.**

**Average Number Failures per Term in Each 100 Pupils for the Period 1913-14-15.**

Failures per 100 Pupils		Failures per 100 Pupils	
Clayton .....	2	Central .....	11
Corona .....	3	Fairmount .....	11
Vassar .....	4	Gilpin .....	11
Gove .....	5	Myrtle Hill .....	11
Grant .....	5	Ashland .....	12
Park Hill.....	5	Bryant .....	12
Boulevard .....	6	Swansea .....	12
Steele .....	6	Emerson .....	13
Valverde .....	6	Lincoln' .....	13
Columbian .....	7	Montclair .....	13
Ebert .....	7	Wyman .....	13
Logan .....	7	Franklin .....	14
University Park.....	7	Milton .....	14
Villa Park.....	7	State Home.....	15
Hyde Park.....	7	Twenty-Fourth Street...	15
Sherman .....	8	Whittier .....	15
Alcott .....	9	Cheltenham .....	16
Berkeley .....	10	Columbine .....	17
Bromwell .....	10	Garden Place.....	17
Edison .....	10	Washington .....	17
Elmwood .....	10	Evans .....	19
Mitchell .....	10	Garfield .....	21
McKinley .....	10	Grand Avenue.....	23
Sheridan .....	10	Fairview .....	33
Smedley .....	10	Fleming .....	34
Byers .....	10	Webster .....	36

Where ten pupils or more out of every hundred fail term after term—the table presents the average for four successive terms—there is serious waste, and therefore serious mismanagement. The presentation of such facts, term after term, will show the board where the waste is occurring, and where more strenuous efforts need to be put forth by their executives. The board will demand that failures be brought down where they are high. They will give their executives control over the factors involved, and then demand results. Their executives will then take in hand such matters as the following by way of remedy: choice of teachers specially fitted for work in the buildings where failures are high; shifting of strong teachers and principals to the buildings giving most difficulty; and putting less capable teachers and principals in buildings where the work is easier; selecting material equipment, books, supplies, etc., of the type most suitable for the work in the backward buildings; changing courses of study so as to meet special needs of the social class to be found in each building; ved methods of teaching; focussing supervision on the places

- where most needed; seeing that children are regular in attendance;
- having the medical department see that children are in physical condition for the work, etc., etc.

The board has not the special knowledge for doing any of these things; but after empowering the superintendent to take them in hand, they are fully able to inspect results as shown by the next term's report to see whether improvement has been made, and whether sufficient. With the figures before them, they can note the steady improvement term after term until it is not possible to make any further improvement. Then their inspectorial duties will be to see that there is no slipping backward; that gains made are held.

### Inspection of Special Promotions.

As the board inspects failures naturally it will also inspect special promotions to see if failures are offset upon the other side. They will discover that at present there is no general consistent effort within the school system. Each school formulates its separate policy. Table XI shows the average number of special promotions each term per 100 students during the two years, 1913-14-15:

TABLE XI.

Number Special Promotions per 100 Pupils Each Term, 1913-14-15.

Emerson . . . . .	10	Myrtle Hill . . . . .	3
Fleming . . . . .	9	Park . . . . .	3
Boulevard . . . . .	6	Sherman . . . . .	3
Fairview . . . . .	6	Swansea . . . . .	3
Gilpin . . . . .	6	Twenty-Fourth Street . . . . .	3
Mitchell . . . . .	6	Bromwell . . . . .	2
Elmwood . . . . .	5	Cheltenham . . . . .	2
Garfield . . . . .	5	Columbian . . . . .	2
Logan . . . . .	5	Columbine . . . . .	2
Ashland . . . . .	4	Fairmount . . . . .	2
Berkeley . . . . .	4	Lincoln . . . . .	2
Central . . . . .	4	Sheridan . . . . .	2
Clayton . . . . .	4	Smedley . . . . .	2
Gove . . . . .	4	Valverde . . . . .	2
Grand Avenue . . . . .	4	Washington . . . . .	2
Milton . . . . .	4	Alcott . . . . .	1
State Home . . . . .	4	Bryant . . . . .	1
Steele . . . . .	4	Grant . . . . .	1
Whittier . . . . .	4	McKinley . . . . .	1
Wyman . . . . .	4	University Park . . . . .	1
Corona . . . . .	3	Villa Park . . . . .	1
Ebert . . . . .	3	Webster . . . . .	1
Edison . . . . .	3	Montclair . . . . .	.4
Evans . . . . .	3	Vassar . . . . .	.2
Franklin . . . . .	3	Garden Place . . . . .	.1
Hyde Park . . . . .	3		



Every legitimate special promotion means a gain to the pupil, and a saving to the school system. If four, five, and six pupils per hundred can make special promotions in so many schools, cannot similar results be more widely achieved? If ten is possible and desirable at the Emerson, why not at some of the others in the same neighborhood? In asking such questions, we are naturally presuming that courses of study, text-books, etc., are as well fitted to the special needs of the pupils in one building as they are in any other. In these things we are presuming that fitness is the aim rather than uniformity. The average number of special promotions per half-year term for 1913-1915 was 678. This means an annual financial saving to the school district of about \$27,000; and an immense saving in time to the pupils. Had there been an average of six special promotions per 100 pupils throughout the school system, the annual financial saving would have been more than \$50,000. The saving to the pupils would have been worth much more than this.

As the board inspects, it will demand that the figures be brought up in those schools where they are very low. The inspection permits them to give a perfectly definite task into the hands of their executive officers; and the continuing inspection term after term permits them to see if at least reasonable results are being achieved.

For carrying out such orders of the board, the school department will need certain special supplies, special classes, and other special arrangements. The board will find out from the superintendent what is needed; it will authorize the things needed; it will give the professional people power over all of the factors; and then it will demand results.

After a sufficient time has been given for securing results, the board will again examine its inspectorial reports to see the extent of improvements made. It will express its approval or disapproval of conditions discovered. If it approves, this means that an order goes out to hold the gains that have been made. Things begin to slip backward the instant the hold is relaxed. The board will not of itself attempt to do any of the holding; but it will give every help possible to its executive agents.

On the other hand, if the board disapproves findings, it will require of the superintendent two things: an explanation of imperfect achievement; and recommendations of things needed by way securing greater power over the obstacles in the way. Far from curtailing the power of its executive agent, it is one of the board's prime duties to see that the superintendent's power over obstacles in the way is as great as possible. The superintendent is the executive arm of the



board. Power in the superintendent over every factor is the one thing that means real power of the board over every obstacle.

The recently raised cry that the superintendent must not have power since this thereby diminishes the power of the board contains no single grain of justification. It is a charge that grows either out of muddled thinking or motives of self-interest. It is exactly the same thing as to say that a blacksmith must curtail the powers of his arm in order that he may remain strong and capable in his work. As a matter of fact the stronger the arm, the stronger the man for the work. In the same way, the stronger the executive arm of the board, the stronger the board for its work.

### **Inspection of Attendance.**

Are the school authorities efficient in getting a sufficient proportion of the school census into school? The board has not yet developed the system of reporting that will enable them to answer this question.

The first question that arises is, What is a sufficient proportion of the school census? The success attained in cities in general ought to give some basis of judgment. Table XII shows the per cent of all children of five to twenty years of age in average daily attendance in the elementary schools.\*

**TABLE XII.**

**Per Cent of All Children 5 to 20 Years of Age in Average Daily Attendance in Elementary Schools of 14 Cities of the Population Class of Denver, 1913-14.**

	Per Cent
Portland .....	54
Atlanta .....	49
Worcester .....	49
Washington .....	49
Minneapolis .....	49
<b>DENVER</b> .....	48
Columbus, O. ....	48
Indianapolis .....	46
Toledo .....	46
Providence .....	42
St. Paul .....	41
Rochester .....	36
Kansas City .....	32
Louisville .....	32

\*The figures are from the Report of the U. S. Commissioner of Education, 1914. Since the census is for slightly different age-periods in different cities, it was necessary to equalize them upon the oneage basis of five to twenty by adding or subtracting age groups at the ends of the scale. The per cent added or subtracted was proportional to the per cent each age-group is of the total population in the 1910 reports of the census.

Judging from usual good practice, Denver ought daily to be getting about 48 or 50 per cent of the children into the elementary schools. The city is reaching the standard successfully.

Is Denver successful in securing a good attendance at the high schools? Table XIII shows that of fourteen cities of the same population class, only two are in advance of Denver.

**TABLE XIII.**

**Per Cent of All Children 5 to 20 Years of Age in Average Daily Attendance in High Schools, 1913-14.**

Portland .....	9.8
Minneapolis .....	8.8
<b>DENVER</b> .....	8.1
Columbus, O. ....	7.9
Worcester .....	7.6
Indianapolis .....	6.9
Washington .....	6.7
St. Paul. ....	5.6
Kansas City. ....	4.9
Toledo .....	4.7
Providence .....	4.6
Louisville .....	4.0
Rochester .....	3.7
Atlanta .....	3.3

Presented with such figures as these, the board can know that as compared with cities in general, Denver on the side of attendance is meeting with reasonable success; is in fact more successful than most cities.

Before being satisfied with this showing, the board will ask for other figures. What per cent of the entire census is of the elementary school ages, six to fourteen? The census taken by the secretary shows that 59 per cent are between six and fourteen years of age. After counting all of the people in kindergarten who are under six and all the pupils in elementary school who are over fourteen the 48 per cent in actual average daily attendance falls very far short of what is possible. It looks as though Denver might very well reach the 54 per cent shown by Portland.

Census children of the usual high school ages, fourteen to and including eighteen years, constitute 30 per cent of the entire Denver enumeration. The 8.1 per cent in average daily attendance leaves much to be desired. Portland's record of 9.8 per cent looks easily attainable.

In inspecting the situation, the board will want to know just where the weaknesses are found, and the degree. They need to examine a table which shows the school census of each building district within the city, and the per cent of the census of that district in average membership each year. This table will reveal the weaknesses. An attempt was made to draw up such a table on the basis of facts to be found in the office of the secretary. The table is herewith given. It is presented however, not as a series of facts, but for illustrating how the gathering of facts can be mismanaged. The writer took the figures of the school census of February, 1915, for each building district; then the average membership of the same month of February in each district. Table XIV shows the per cent the membership was of the census.

TABLE XIV.

Per Cent of Building District Census, February, 1915, Reported in Membership in the Schools of the Districts in Same Month.

	Per Cent		Per Cent
Garden Place .....	74	Valverde .....	51
Park Hill .....	69	Villa Park .....	51
Lincoln .....	69	Berkeley .....	50
Sheridan .....	67	Edison .....	50
Bromwell .....	67	Smedley .....	50
Bryant .....	66	Evans .....	49
Cheltenham .....	65	Swansea .....	49
Garfield .....	65	Twenty-Fourth Street....	48
Steele .....	64	Gove .....	47
Corona .....	62	Central .....	47
Fairmont .....	62	Logan .....	46
Milton .....	62		
Sherman .....	61	Webster .....	46
Montclair .....	60	Whittier .....	46
Byers .....	59	Mitchell .....	43
Alcott .....	58	Gilpin .....	43
Elmwood .....	58	Wyman .....	42
Myrtle Hill.....	57	Hyde Park .....	42
Clayton .....	55	Emerson .....	39
Columbine .....	55	Fairview .....	38
Grant .....	55	University Park.....	38
Boulevard .....	53	Ebert .....	30
Ashland .....	52	Franklin .....	29
Columbian .....	52	Vassar .....	28
McKinley .....	51	Washington .....	25

Could these figures be interpreted at their face value, they would mean that 74 per cent of all children 6 to 21 years of age in the Garden Place district were in school during the month the census was taken; that in the Corona 62 per cent were in school; in the Ashland, 52 per

cent; in the Hyde Park, 42 per cent; in the Ebert, 30 per cent; and in the Washington only 25 per cent.

Evidently many of the figures are of no significance in themselves. There is no such diversity of conditions in the different districts. The table simply indicates that the board of directors has not sufficiently recognized the value of the balance-sheet for checking up its affairs. The census is one accounting of the city's children. The school records constitute a second and separate method of accounting. One should be placed over against the other. Each then serves as a check upon the other. The lack of so simple a feature of good management is symptomatic of long inspectorial neglect.

The plan requires that census districts coincide with building districts; and that account be taken of children enumerated in one district and attending in another.

Even as the figures stand, benefit can be derived from a study of all of those in which census and building districts are coterminous.

### **Inspection of the Progress of the Children.**

The pupils are expected to go through the grades normally by spending one-half year in each half-year grade. Normally the sixteen half-year grades should be finished in eight years, neither more or less. A pupil who is able to complete the work in less than eight years is making rapid progress. One who completes it in a period greater than eight years is making slow progress. Of the pupils in the elementary schools of Denver, not counting kindergartens or special classes, in December, 1915, 4,553 were making rapid progress; 10,413 were proceeding normally, while 7,319 were making slow progress. The figures probably represent proportional rates, though it seems that not quite all the pupils were reported. To make the figures significant for inspectorial purposes, they need to be reduced to units and examined by buildings. Table XV shows the number of pupils per hundred in each of the various buildings that were making progress through the grades more rapid than normal.

28

18

48

82

28

TABLE XV.

Number of Pupils Per 100 Making Rapid Progress, 1915.

School	Pupils per 100	School	Pupils per 100
Logan .....	35	Lincoln .....	19
Gove .....	29	Villa Park .....	19
Sherman .....	29	Washington .....	19
Steele .....	29	Ebert .....	18
Wyman .....	29	Alcott .....	17
Myrtle Hill .....	28	Ashland .....	17
Mitchell .....	27	Hyde Park .....	17
Boulevard .....	27	Milton .....	16
Clayton .....	26	McKinley .....	14
Elmwood .....	26	Swansea .....	14
Park Hill .....	25	Orphan's Home .....	14
Whittier .....	25		
Bromwell .....	24	Fairmount .....	13
Columbian .....	24	Franklin .....	13
Corona .....	24	Byers .....	12
Grant .....	24	Bryant .....	11
Smedley .....	24	Fairview .....	11
Cheltenham .....	23	Berkeley .....	11
Edison .....	22	Fleming .....	10
Evans .....	22	Montclair .....	10
Valverde .....	21	Garden Place .....	9
Columbine .....	19	Sheridan .....	9
Gilpin .....	19	Webster .....	5

For purposes of inspection it is well to divide such a table into four groups, each consisting of approximately a quarter of all of the schools. An examination of the table shows that the schools of the highest quarter are two and three times more successful than those of the lowest quarter as measured by the number of pupils per hundred who are making progress more rapid than normal. The third quarter of buildings shows what is possible, in all probability, in many of the buildings of the second quarter. Those of the second quarter show what is possible for very many of the buildings of the lowest quarter. The dozen buildings of the lowest quarter represent conditions very much below the average. These inspectorial facts show clearly the buildings where administrative adjustments should be made. The superintendent and his staff will be asked to study the situation, to draw up plans for improving conditions; the board will then provide as far as possible the things necessary for improving the conditions, and will then leave to its executive officials the responsibilities of making such improvements. Year by year they will examine the facts to see if the improvements are being made.

Perhaps even more significant are the figures showing the relative success and the relative failures of the different buildings in keeping children from falling behind grades, and therefore from making progress slower than normal. Table XVI shows the number of pupils per hundred in the various buildings who have been making progress slower than normal. The figures do not include pupils of special retarded and sub-normal classes in the city. The figures present a situation somewhat more favorable than the total figures would show.

**TABLE XVI.**

**Number of Pupils Per 100 Making Progress Slower Than Normal.**

School	Pupils per 100	School	Pupils per 100
Fleming .....	9	Alcott .....	33
Clayton .....	12	Garfield .....	34
Gove .....	13	Montclair .....	34
Myrtle Hill .....	18	Byers .....	36
Corona .....	20	Cheltenham .....	36
Boulevard .....	22	24th Street .....	36
Columbine .....	22	Washington .....	36
Lincoln .....	23	Ebert .....	38
Logan .....	23	Fairmont .....	38
Logan .....	23	McKinley .....	39
Park Hill .....	23	Central .....	39
Elmwood .....	24		
Whittier .....	26	Franklin .....	41
Wyman .....	26	Gilpin .....	42
Villa Park .....	26	State Home .....	42
Smedley .....	27	Valverde .....	43
Ashland .....	27	Bryant .....	44
Columbian .....	28	Orphan's Home .....	48
Edison .....	28	Berkeley .....	49
Steele .....	28	Milton .....	49
Evans .....	30	Sheridan .....	49
Hyde Park .....	30	Swansea .....	51
Sherman .....	30	Garden Place .....	62
Bromwell .....	32	Webster .....	71
Grant .....	32	Fairview .....	74
Mitchell .....	32		

The table shows clearly that the highest quarter of the buildings are two and three times as successful in preventing the presence of retarded pupils than is the case with the dozen buildings at the bottom of the list. A building in which more than forty pupils in every hundred are proceeding through the grades more slowly than ought to be the case is clearly laboring under difficulties that need to be corrected. It is altogether probable that all of the lowest quarter could with help do

at least as well as those of the second quarter of buildings from the bottom. The buildings in this second quarter might very well strive after the success attained by those of the quarter next to the top, and those of the second quarter from the top might very well pattern their efforts upon the success attained by the upper dozen buildings. This plan sets up standards that are attainable.

The various causes need to be carefully ascertained. While some of these are social in character and due to the conditions in the community, very many of them are under the control of the educational organization. These inspectorial figures show the board where efforts need to be made. They help the board to appreciate the requests made by the superintendent for the necessary instructional and material provisions required for preventing the inefficiency clearly evident in moving the children through the grades.

The figures of this table as well as those of numerous other tables presented show the urgent need of strengthening the overhead organization through the employment of assistant superintendents who can currently gather facts of this type for purposes of diagnosis, and who can keep in such constant contact with all portions of the situation as to discover and to remedy the various kinds of difficulties causing this highly expensive retardation. As we have already said, every time a hundred pupils require an extra year for their passage through the grades, it entails upon the school district an expenditure of about five thousand dollars. The saving on this feature alone would more than pay for the necessary assistant superintendents. Of still greater importance than the financial is the saving to the young people through passing through the grades on schedule time.

The figures show roughly the places where improvements are needed. As a matter of fact, however, the pupils in a building who are making rapid progress, while they may be fairly numerous, may be averaging only a small amount of progress above the normal, or a fairly large average progress in advance of normal. On the other hand, in buildings where a considerable number are behind, they may average only a little behind grade, or they may be a great deal behind normal progress. It would complicate our discussion here too greatly to present all of the kinds of tables that should be examined by the board in its inspectorial capacity, and which should be prepared by the assistant superintendent for purposes of bringing about administrative efficiency. We shall, however, present one Table No. XVII, which summarizes the total age-progress situation in such a way as to show the buildings that are most successful when the various factors of age and progress are



taken into consideration, and also the buildings that are least successful when all of the factors are taken into consideration. The unit of measurement is one child making one half-year step either of age or of progress in advance of normal; or one similar half-year step behind normal. Taking the average rate of the entire system as the normal for the system, the figures show the number of half-year steps per hundred pupils in advance of this normal average or behind this average in the case of each of the schools. The schools for which the figures are preceded by a minus sign are below the normal average for the city. Those at the top of the scale without the minus sign are making progress in advance of the normal average for the city. The indices of progress are calculated from data furnished by teachers and principals for the purpose. No account was taken of kindergartens; nor of children already segregated for special training. It shows only how pupils in regular classes are getting on.

TABLE XVII.

**Relative Age-Progress Standing of Different Schools, Showing Number of Steps Per 100 Pupils in Advance of or Behind Average for Entire City System, November, 1915.**

School	No. of Steps per 100 Pupils	School	No. of Steps per 100 Pupils
Clayton .....	124.1	Gove, Aaron .....	118.5
Logan .....	98.0	Steele .....	89.7
Fleming .....	87.1	Park Hill .....	81.3
Myrtle Hill .....	60.2	Wyman .....	79.6
Boulevard .....	68.2	Lincoln .....	59.3
Columbian .....	59.1	Whittier .....	58.9
Sherman .....	55.4	Edison .....	53.7
Corona .....	49.9	Smedley .....	46.0
Elmwood .....	44.2	Ashland .....	37.7
Columbine .....	37.3	Mitchell .....	33.8
Cheltenham .....	33.7	Bromwell .....	19.2
Villa Park .....	15.8	Grant .....	14.0
Hyde Park .....	7.5		
24th Street .....	6.5	Alcott .....	4.0
Fairmont .....	— 2.4	McKinley .....	— 2.4
Evans .....	— 3.2	Gilpin .....	— 7.4
Ebert .....	—18.7	Garfield .....	—22.5
Byers .....	—23.1	Berkeley .....	—26.8
Central .....	—27.9	Bryant .....	—33.0
Valverde .....	—36.1	Denver Orphan's Home .....	—56.1
Franklin .....	—60.6	Milton .....	—64.3
Montclair .....	—65.8	Fairview .....	—68.1
Sheridan .....	—80.0	Swansea .....	—83.3
Washington .....	—114.1	Garden Place .....	—170.3
State Home .....	—249.1	Webster .....	—253.9

All of the age-progress tables show a very ragged situation within the city school system. They show a quality of work which, judged on the basis of the average for the city, ranges from excellent upon the one hand to very poor upon the other. This mode of diagnosing the situation shows the schools to which supervisors will go by way of finding out how the successful schools manage to be successful. The figures also show the schools where the information thus learned is to be applied by way of improving conditions—at least so far as matters are under the control of the school system. The facts also show where it is desirable from a civic welfare point of view for the schools and other civic agencies to do what then can by way of getting some hold upon the other social influences that are not directly under the control of the school system.

When the board is confronted by the figures showing such a ragged situation within the school district, it will demand that conditions be improved; that the superintendent and his force of twelve hundred and fifty people get a hold upon those portions of the situation that are below standard; that they labor at the factors until conditions in all of the districts are brought up to a standard that is reasonable for the particular district. The board will demand similar facts year after year to see if the improvements have been made. Naturally the board, in demanding results, will place the control over all of the means of securing the results, in the hands of the superintendents and his large staff of helpers. They will demand that every member of the force be brought up to as high standard of working efficiency as possible through the labors of superintendent, principals and supervisors. The board will naturally exert all legitimate means within their power of keeping every member of the force within the service after they have been brought up to this standard.

### **Inspection of the Success Attained in Giving a Full Common School Education at All.**

There is a pretty general agreement that every citizen within a democracy should have at least an entire common school education. As a matter of fact, we are coming rapidly to go very much beyond this, and to insist that there should be vocational training, continuation training, civic training, etc., beyond what is possible normally in the elementary schools. This being the case, the community must insist that its citizens shall at least have had a minimum of one full eight-grade course.

The question confronting the board in its inspectorial capacity is therefore, How successful are the various schools of the city in bringing their pupils to the full completion of the eighth grade?

Table XVIII shows the situation. It shows the average number of pupils per hundred in average membership for the year 1909 to 1913, graduating from each of the schools. By taking a five-year average, in this manner, we even up the irregularities which would appear from taking the figures of a single year.

**TABLE XVIII.**

**Average Annual Number of Eighth Grade Graduates Per 100 Pupils  
in Average Membership.**

1909-1914.

Graduates per 100 Pupils		Graduates per 100 Pupils	
Clayton .....	14	Bromwell .....	7
University Park .....	11	Franklin .....	7
Wyman .....	11	Fairmont .....	7
Ashland .....	11	Lincoln .....	7
Columbian .....	10	Mitchell .....	6
Logan .....	10	Barkeley .....	6
Grant .....	10	Hyde Park .....	6
Corona .....	10	Gilpin .....	6
Edison .....	10	Swansea .....	6
Villa Park .....	9	Sherman .....	6
Byers .....	9	24th Street .....	5
Whittier .....	9	Cheltenham .....	5
Park Hill .....	9	Alcott .....	5
Valverde .....	9	Sheridan .....	5
Myrtle Hill .....	9	Central .....	5
Boulevard .....	9	Garfield .....	5
Montclair .....	8	Evans .....	4
Emerson .....	8	Smedley .....	4
Vassar .....	8	Garden Place .....	3
Bryant .....	8	Milton .....	3
Columbine .....	8	McKinley .....	3
Ebert .....	7	Washington .....	2

The table reveals a very uneven showing. Some of the schools are able to hold the majority of their pupils throughout the entire elementary course. Other schools are able to hold only a small minority of the pupils. In the dozen buildings standing lowest in the list, the majority of children are failing to receive the minimum education now considered necessary. As a matter of fact, the children in the Washington, the McKinley, etc., have as great need of eight full years of education in the public schools as the children in the Clayton, the University Park,

and others standing at the head of the list. The good social environment surrounding most of the pupils in these latter schools constitutes a large part of their education, and in large degree makes good any defects in length of course. But this is not the case where the children come to school from an undesirable, and in large part, un-American, social environment. Such children are really the ones who are in greatest need of a long and thorough common school training.

If these statements are valid, then the school district should strive to bring up the number of graduates in this lowest dozen schools at least to the level of what it is in the highest dozen schools. It is not too much to ask that in all schools there be not less than an average of eight or ten eighth-grade graduates per 100 pupils in average membership. A school that falls below this very moderate standard needs examining into. In all probability the course of study is in need of special attention. The work needs to be given a character that is not only the most valuable possible for the pupils in each of the districts, but which also will appeal both to the pupils and to their parents as being too valuable a thing to miss. Adjustments are also needed in the matters of textbooks, supplementary and library books, qualifications of teachers, cooperation of teachers and community, etc., etc. With these inspectorial facts before the board, they are in a position to appreciate the recommendations of superintendent and his helpers as they recommend and make requests for the things needed in the work. By having a five-year average taken, at the end of every year, the board can see whether the standard is rising with sufficient rapidity in the case of the backward schools. Such facts constitute the board's strongest leverage upon the administrative organization in **getting things done**.

### **Inspection of the Results of Instruction.**

"Accurate and ample information is the first step toward success in any undertaking," says James J. Hill, empire builder of the Northwest. This applies to the labors of instruction as fully as to the management of a railroad, a bank, or a big department store. In the teaching of spelling, writing, arithmetic, composition, etc., the first step toward success is accurate and ample information as to the exact results that should be obtained in the class-room work. The second step is careful and accurate measurement of the results periodically to see if a sufficient measure of them has been secured. Both of these kinds of work require the development of methods of measuring educational results. These methods are now being rapidly developed for the entire educational field. They promise to be one of the most effective instruments

possible in behalf of the community, school board, superintendent, principals, and teachers for the furtherance of work within the class-rooms.

We can make the matter clear by a single illustration. Dr. Ayres of the Russell Sage Foundation has, upon the basis of very extensive investigations, formulated a spelling-scale for measuring the results of the spelling teaching in all of the grades from the second to the eighth. This has been used for measuring the work in spelling in the class-rooms of Denver.

The test sent out to all the classes of the city was of such degree of difficulty, that each class should have made a record of 70 per cent. This standard was determined from the use of this test in 84 different American cities. While on the basis of average practice throughout the United States, each of the classes in Denver ought to have averaged 70 per cent, as a matter of fact, a few classes made a 100 per cent, while a number of other classes made less than 40 per cent. Table XIX shows the record made by twenty classes taken at random:

**TABLE XIX.**

**Spelling Ability of 20 Classes Taken at Random.**

Class A	made 98; should have made 70
Class B	made 93; should have made 70
Class C	made 92; should have made 70
Class D	made 98; should have made 70
Class E	made 84; should have made 70
Class F	made 83; should have made 70
Class G	made 80; should have made 70
Class H	made 79; should have made 70
Class I	made 78; should have made 70
Class J	made 75; should have made 70
Class K	made 74; should have made 70
Class L	made 74; should have made 70
Class M	made 72; should have made 70
Class N	made 70; should have made 70
Class O	made 68; should have made 70
Class P	made 62; should have made 70
Class Q	made 58; should have made 70
Class R	made 57; should have made 70
Class S	made 55; should have made 70
Class T	made 51; should have made 70

The community and the board of directors do not have to understand methods of teaching in order to inspect the results of the work and thus see if they are coming up to standard. The table shows at a glance that in spelling, the majority of classes in this random sam-

pling—and it probably represents the general situation within the city—the majority of classes make a record that is above the standard of 70. It can be seen that the work is not only well done in the majority of classes, but that it is very much above standard in certain of the classes. On the other hand, the board of directors and the community can see that within certain classrooms of the city, the work falls much below standard. It should be remarked that the figures here presented are taken from schools of similar social character, so that the social factor does not enter in. The differences are mainly due, it appears, from the character of the work that has been done by these different classes.

While it is not the business of the board of directors to teach the spelling or to do any detailed work whatsoever in connection with this teaching, yet they do bear full responsibility for getting the work done. These figures and others of similar character that should be gathered and presented to board and community, enable them not only to see that the work is not up to standard in certain classes, but it also enables them to make specific demands upon the administrative organization for bringing the work up to standard in every one of the classrooms where it is below standard. They can say to the superintendent and his staff that in the class making a record of 51, methods of teaching, time given to the work, text book used and other factors need to be so adjusted as to bring this class up to the point where it can make a record of at least 70. To get this work done, they do not need to mix in it any degree whatsoever. In fact, they can only do harm to the work by attempting in any way to control the details of it. They will simply say to the superintendent and his staff: “The teachers of classes A, B, C, D, etc., know how to get the work done so as to bring it very much above standard. Now it is your business to see that the methods employed in these classes are extended to the work of classes Q, R, S, T, etc., in sufficient measure to bring their work up to 70 or above.” Board and community can manage solely on the basis of the inspectorial examination of the results.

After the facts are discovered, and expectations made clear, board and community will give their administrative organization sufficient time to bring up the results. They will then ask that a second measurement be made to see if the records of these rooms stand at 70 or above. Board and community thus have absolute control over the labors of the administrative organization without even in the smallest degree interfering in its detailed labors.

Board and community, for their inspectorial purposes, will see that these measurements of results, so far as the means have been developed, are currently carried on and the results presented for inspectorial



examination. This is scarcely possible at the present moment. An assistant superintendent, expert in the details of this type of work, must first be had. Most of the work will be done by principals and teachers. Certain of the principals are already thoroughly informed as to methods and means of work. The majority, however, are insufficiently informed, and therefore require leadership and direction. The work does not imply any addition to the labor of teachers, because of the fact that the measurement is a teaching device as well as a measuring device. Teachers whose work is up to standard or above, are always glad to have their work measured and to have the results reported. Teachers whose work is not up to standard, are also glad to have the work measured, since it reveals the places where they are in need of help of one kind or another; and it brings, therefore, the help of principals, special supervisors, assistant superintendent and superintendent immediately to those particular classrooms. The teacher knows that, from that moment forward, her work is going to come up to standard and that it is going to be kept up to standard. No teacher will care to cover up weaknesses discovered through such measurement, because she knows that the weakness once discovered can be of only temporary duration. Even the weakest of teachers has her strong points. In spite of certain temporary disagreeableness, she is glad to have her weak points discovered in order that they can be made strong. The plan will work in almost every case. Teaching ability is mainly a matter of training—and very largely, training during service. The way to keep a teaching corps up to standard is to find the weaknesses in ways here and in other places mentioned, and then to bring the best knowledge within the system to bear so as to eradicate the weaknesses. The occasional teacher who will not respond, is one who, for some reason, can not respond.

A full discussion of the possibilities of measurement for inspectorial purposes in connection with handwriting is presented in another section of this report.

### **Inspection of Instruction Costs.**

As the board of directors authorizes the number of teachers to be employed, and fixes the salary schedule for teachers, it really determines the amount that will be expended per pupil upon the one item of instruction. With equitable management and good bookkeeping methods, one will expect to find the average cost of instruction per pupil to be not greatly different in the different buildings. The situation as actually found in 1913-14 is shown in Table XX.



TABLE XX.

**Cost Per Pupil in Average Daily Attendance of "Pay Roll of Teachers  
and Other Employees," 1913-14.**

	Cost per Pupil		Cost per Pupil
Manual High .....	\$93	Byers .....	\$25
Longfellow High.....	91	Emerson .....	25
West High .....	70	Swansea .....	25
East High .....	63		
North High .....	62	Twenty-fourth St. ....	25
South High .....	59	Bromwell .....	24
		Hyde Park .....	24
Grant .....	31	Milton .....	24
Gilpin .....	30	McKinley .....	24
Whittier .....	30	Smedley .....	24
Berkeley .....	29	Wyman .....	24
Boulevard .....	29	Alcott .....	23
Corona .....	29	Bryant .....	23
Garfield .....	29	Central .....	23
Ashland .....	28	Edison .....	23
Valverde .....	28	Elmwood .....	23
Washington .....	28		
Clayton .....	27	Fairmont .....	23
Columbine .....	27	Montclair .....	23
		Steele .....	23
Franklin .....	27	Columbian .....	22
Gove .....	27	Lincoln .....	22
Univ. Park .....	27	Logan .....	22
Evans .....	26	Myrtle Hill .....	22
Mitchell .....	26	Sherman .....	22
Park .....	26	Cheltenham .....	21
Sheridan .....	26	Garden Place .....	21
Vassar .....	26	Webster .....	19
Villa Park .....	26	Ebert .....	18
		Fairview .....	16

Looking to the high schools alone, it will be observed that the cost of instruction in the Manual High was 50 per cent. higher than in the North Side and the South Side High schools. The question at once arises whether teachers are underpaid or overworked in the two least expensive high schools. There is the further question whether the instruction is kept up to the same standard to be found in the Manual High School. If the work is well done in the North Side High School, if teachers are not overworked and if their interests are otherwise properly taken care of, then the question arises why the city should be willing to expend so very much more upon the Manual Training High School. On the other hand, if the work actually requires so large an expenditure as at the Manual High, then there arises the question of how to justify the neglect of the pupils' and teachers' interests in the two least expensive high schools. If satisfactory explanation can n

be presented, the board of directors will ask its executives to bring expenditures more nearly to the same level in the different high schools. Whether this will mean shifting expenditures upward at the North High and the South High, or whether it will mean bringing expenditures downward at the Manual High, is a thing that will have to be determined on a basis of the standard that the city is willing to support.

In the elementary schools, the instruction is very unequally supported. In certain of the schools where strong work is very greatly needed, as indicated by failures, scarcity of graduates, etc., the work is least adequately supported. There are no schools in the city any more in need of strong teaching than the Fairview, the Ebert, the Webster, the Garden Place and the Cheltenham. The figures, however, present clear proof of neglect to take care sufficiently of the factors that make for strong teaching.

### **Inspection of Cost of Text Books, Library and Supplementary Books.**

Most progressive cities in the United States have introduced or are now introducing the so-called free text book system. The system has long been in operation in Denver. Whether the schools have been adequately supplied as adjudged upon the basis of current practice in other cities of the country is indicated in some degree at least in Table XXI.

**TABLE XXI.**

**Cost of Text-Books, Library and Supplementary Books, 1913-14, in 16  
Large Cities Taken at Random, Known to Have Free  
Text-Book Systems.**

**Report U. S. Bureau, 1914.**

	Cents per Pupil
	Dollars per 100 Pupils
Lowell .....	98
Washington, D. C.....	85
Philadelphia .....	83
Jersey City .....	82
Baltimore .....	73
Paterson .....	61
Newark .....	61
Worcester .....	59
Omaha .....	58
Boston .....	57
Providence .....	55
Pittsburgh .....	54
Cambridge .....	47
<b>DENVER</b> .....	<b>46</b>
Scranton .....	40
Fall River .....	37

The table shows that Denver's expenditure upon the intellectual nutriment of the children is relatively light. Denver finds herself within the most backward quarter of the cities. The city, after having built an expensive school plant and after employing an expensive corps of teachers, principals, janitors, engineers, etc., appears to be supplying an inadequate quantity of the indispensable tools of instruction.

The deficiency is very serious in the case of certain of the buildings. Table XXII shows the annual average expenditure over a five-year period for all of the intellectual nutriment supplied by the board of directors in the form of text books, library and supplementary books to the various buildings.

**TABLE XXII.**

**Average Annual Cost, 1909-1914, of Text-Books, Library Books, and Supplementary Books.**

Cents per Pupil, Dollars per 100 Pupils		Cents per Pupil, Dollars per 100 Pupils	
Valverde .....	\$83	Emerson .....	\$46
Smedley .....	68	Berkley .....	46
University Park .....	64	Villa Park .....	45
Wyman .....	64	Edison .....	45
Grant .....	63	Park Hill .....	45
Myrtle Hill .....	63	Hyde Park .....	44
Corona .....	58	Clayton .....	43
Ashland .....	56	Fairmont .....	41
McKinley .....	55	Sherman .....	41
Bromwell .....	55	Ebert .....	40
Vassar .....	55	Evans .....	40
Byers .....	55	Washington .....	40
Franklin .....	53	Bryant .....	\$40
Central .....	53	Garden Place .....	40
Garfield .....	52	Mitchell .....	49
Columbian .....	52	Elmwood .....	39
Lincoln .....	51	Cheltenham .....	38
Montclair .....	51	Swansea .....	38
Milton .....	51	Boulevard .....	38
Logan .....	50	Twenty-Fourth Street ....	36
Whittier .....	48	Gilpin .....	36
Alcott .....	48	Webster .....	34
Columbine .....	47	Fairview .....	23
Sheridan .....	47		

Within the buildings where the supply has been most adequate there has been an expenditure of over 62 cents per pupil. This expenditure is not high; if anything, it is too low. The efficiency of the work

in the buildings in many cases can be doubled and more than doubled by an adequate expenditure at just this point. The saving through the prevention of failures, and the gains through securing greater results, would be very great. In all probability, the standard expenditure upon the middle 50 per cent. of the buildings, ranging from 40c to 53c per pupil is too low; but taking this range as a proper minimum one, it is clear that certain of the buildings are being seriously neglected. In the Fairview, over a five-year period, the expenditure each year for the intellectual nourishment for a whole year for each child has been only the price of a good cigar. About half of this was for text books and about half for supplementary books. The figures represent intellectual starvation. As one views these figures, one finds a part of the explanation of the fact that 74 pupils in every hundred at the Fairview are making slower progress than normal—the greatest per cent. of retardation upon this basis to be found in the entire city.

The treatment of this building does not represent willful and pre-meditated mismanagement. The board of directors during the years that this was occurring did not see these figures or anything like them. The board was unaware of the serious mismanagement that was going on. It was not attempting to find standards of practice or to perform its inspectorial functions on the basis of accurate accounting. To prevent mistreatment of 300 pupils each year in a single building is enough to warrant the periodical accumulation of the facts necessary for inspectorial supervision. Every such table, however, for the present, at least, will reveal the presence of not less than a dozen buildings, in which investigation and adjustment need to be made. These figures probably indicate desirability of bringing up conditions in the lower three quarters of the buildings to the level represented by the highest quarter.

### **Inspection of Costs of Instruction Supplies.**

In addition to text books, etc., the other main tools of instruction are classified under the heading of "Instruction Supplies." The annual average cost over a period of five years is shown in Table XXIII.

TABLE XXIII.

Annual Cost in Cents Per Pupil or in Dollars Per 100 Pupils of  
Instruction supplies.

Average of Five Years, 1909-14.

	Cents per Pupil, Dollars per 100 Pupils		Cents per Pupil, Dollars per 100 Pupils
Vassar .....	\$24	McKinley .....	\$16
Myrtle Hill .....	22	Berkeley .....	16
Byers .....	21	Garden Place .....	15
Bromwell .....	21	Smedley .....	15
Milton .....	21	Columbian .....	15
University Park .....	20	Edison .....	15
Ebert .....	20	Grant .....	15
Sheridan .....	20	Cheltenham .....	15
Central .....	20	Hyde Park .....	15
Lincoln .....	19	Villa Park .....	15
Valverde .....	19	Fairview .....	15
Park Hill .....	18	Garfield .....	14
Gilpin .....	\$18	Columbine .....	\$14
Franklin .....	18	Alcott .....	14
Logan .....	18	Webster .....	14
Twenty-Fourth Street ....	18	Sherman .....	14
Mitchell .....	18	Wyman .....	14
Corona .....	18	Evans .....	13
Fairmont .....	18	Washington .....	13
Swansea .....	17	Boulevard .....	13
Clayton .....	17	Bryant .....	13
Elmwood .....	17	Montclair .....	13
Ashland .....	17	Whittier .....	13
Emerson .....	16		

As with books, this represents a field of expenditure in which moderate generosity is an economy in the end. It permits the handling of a larger average number of pupils by each teacher, and it helps to prevent that luxury that no city system can afford, namely, failures of pupils and the consequent retardation.

Based upon the usual practice in progressive cities, the expenditures for instruction supplies for the buildings for which the most is expended, is too low; 25c per pupil for the instruction supplies for an entire year is too little for efficient instruction. It is not economy in the end. But if there is deficiency in connection with the schools that are best supplied, this is much more the case with schools of the lowest quarter.

The standard to be set, however, is a matter to be taken under careful consideration by the board of directors upon the recommendation of the superintendent. After this standard is once determined, as

these tables are drawn up for the annual inspection of the board, the middle 50 per cent. of the buildings will approximate this standard. There will naturally be variation upward and downward beyond the limits of the middle 50 per cent. The board can then require that the necessary readjustment be made in order to bring expenditures in all buildings within the minimum and maximum limits set in determining the standard. The board will see that there will be no waste as revealed by excessive figures in the case of buildings at the top of the scale. With greater care, however, they will see that there is no neglect of the welfare of the children in the buildings at the lower end of the scale. This neglect means wasted opportunity, which is a more serious kind of neglect than waste of money.

Costs of supplies will change from year to year, as procedure changes. But the change ought to be much the same in all of the elementary school buildings.

### **A Caution.**

If the district is unwilling to leave the management of the material affairs of education to the superintendent and assistant superintendent in charge of business affairs, it is doubtful whether these inspectorial methods as regards finance, should be adopted.

When the business manager is independent of the superintendent, he tends to interpret the phrase "efficiency in business management" as synonymous with "making a record for keeping down expenditures." Annual reports that show that costs are kept down, or even lowered, are the things for which the plan practically impels him to work.

As the superintendent strives to increase the quality of the only thing the schools stand for, namely, the training, the two men find themselves often working at cross purposes. The use of these inspectorial methods under such conditions practically always creates and intensifies strife between the two departments. The superintendent so frequently can see the false economy of saving money at the expense of educational effectiveness; and knowing that his is the work for which the whole system is organized, he fights for the welfare of the children. The more keenly he realizes the educational needs and the more energetically he strives to serve the community welfare, the harder will he fight when the two clash. And he generally loses, immediately or in the end. The business manager, in dealing with finance, is dealing with a simple thing that the layman easily understands; the superintendent with highly intangible things that the layman does not understand. The business manager can usually put up a stronger case, not because it has greater merits, but because the board already has in

mind the simple bases of judgment. The superintendent works at a great disadvantage because the board members have not already an understanding of the bases of his arguments. Material interests win over instructional interests. Material interests become an end of striving to the one man, while to the other they are but a means. The system is a vicious one, as proven by the experience of many cities.

The divided system gets started in perfectly innocent and harmonious ways. Both men are well-intentioned. But as the business management gains momentum and power, and as the business manager almost inevitably develops the view that the material affairs are ends in themselves, and as efficient inspectorial methods look at these affairs as ends also, and judge them in isolation from the instruction, mischief enters and instruction suffers.

For this reason, if the district is unwilling to adopt all of the demands of a system of good management it would best go slow about adopting any part of them. To adopt part only of such a system may easily do more harm than good. If the district wants looseness of management in a part of the system, it is safer to keep a more or less balanced type of looseness throughout. A high-power engine in a loosely-built car is unsafe.

We therefore earnestly warn the city against adopting efficiency methods if there are to be two administrative organizations within the district, one having to do with instruction and the other independently with the material conditions of instruction.

It is probable that the district wants time to make up its mind. If so, we make the following recommendation:

Since the system recommended in this report and the new by-laws are in entire harmony, and since the system is the only one recommended for the use of large cities in any responsible recently published book upon the subject, the district will be safe in deciding to leave by-law arrangements as they are for a time. In the meantime, the recommendations can be discussed, the authorities can be examined, and the district can make up its mind as to the system preferred.

A district after consideration can choose wrongly. There is a chance of fifty-one to forty-nine that it will choose rightly. The chance is worth trying for. The civic education obtained will repay for the effort; and will improve the chances for the next time.

### **Preparation of Facts for Inspectorial Purposes.**

In our discussion here, we have presented samples only of the kind of facts required for inspection. Other types of facts needed for the purpose are presented in the various reports of the survey.



An examination of the various types of facts presented shows the complexities of the task of assembling and organizing the necessary information. No further argument is required by way of showing the need of a specialist within the system who is thoroughly familiar with the technique of statistical organization. Statistical work at bottom is not merely putting up tables of figures. It consists primarily of such a mastery of the educational factors involved in a situation that one can reveal these factors in the concise terms of a table of figures.

Almost anybody can put up tables of meaningless figures of the type with which we are flooded nowadays in official reports; but which can not be used because they have not been organized for the purpose of shedding clear light upon **management**. Only a man who is both a statistical and educational specialist can draw up figures for purposes of illumination of educational situations.

The district can not hope for the highest type of good management until such a man is permanently employed.

One needs only to refer to any well-managed commercial establishment, railroad or factory, to learn the place of accurate accounting as to all of the factors, as the basis of all good management. Without such accounting, these business establishments are bound to fail. And when they fail, they know it. The school system that neglects accounting as the basis of good management, is equally sure to fail. The one difference is that the failure is saddled upon a long-suffering community—and the lack of accounting makes it easy to leave everybody in the dark—board of directors included.

Ignorance of the failure does not obliterate the failure. The city pays the full price in wasted money; but more particularly in the wasted opportunity of its growing citizens. They will not be what they might have been. The city will not be what it might have been.

The city must have experts, therefore, to take care of the **fact-accounting**, the only possible basis of good management.

### **The Board's Use of Inspectorial Facts.**

The board will examine all such facts for the purpose of ascertaining the success of the administrative system in securing the results implied in the general policies. In so far as such facts indicate satisfactory accomplishment they will use them for holding the gains that have been made. When they show inadequate accomplishment, they will use them for stimulating the administrative organization to strenuous exertion.

In reporting the results of their findings, and in this stimulation of the people within the system, they will have official dealings only

with the superintendent and with such other administrative officials as he may at the time associate with himself for the purpose.

The figures presented in certain of our tables indicate unsatisfactory management in connection with many of the buildings in the city. The board of directors, however, neither individually nor as committees, nor as an entire board will go to those buildings for making the needed adjustments. They will report their findings to the superintendent and require that he straighten out the situation. They are qualified to get things done because they can see from a succeeding report whether the undesirable conditions have been remedied; but they are not qualified for doing the work themselves.

When the facts presented in these inspectorial reports are not thoroughly understood in board meetings, there can be no objection to the board's going to the buildings where these maladjustments exist for the purpose of seeing conditions with their own eyes. The more of such first-hand information that the board can possess, the better for all concerned. In using their information, however, they will have relations only with the superintendent. They will not at the buildings try to direct principals, teachers, engineers, janitors, repairmen, or any of the other workers within the administrative organization. This is really only a common-place of the business world. When the board lets a contract for the erection of a school building, after approval of plans and specifications, it leaves all of the detailed labors of management to the contractor. The board has a full right to observe the labors involved in the erection of the building either directly themselves or through a supervising architect; but they will not interfere in even the slightest degree with the detailed labors of the workmen. If they see anything that is not to their satisfaction, they go to the contractor, and they go to him alone. Even so, in the school organization when things are found wanting, they will go solely to the superintendent.

### **Antecedent Inspection.**

In matters of large moment, the board will exercise inspectorial approval or disapproval, antecedent to the performance of the acts. This will be the case with such things as the following: Putting new courses of study into operation; the adoption of new series of textbooks; the appointment and dismissal of teachers, principals, special supervisors, assistant superintendents, and all other administrative employees; the purchase of school sites; the construction of new buildings or of additions to buildings; entering into contracts or otherwise expending district funds in excess of a specified minimum amount.

As the board of directors exercises its powers of antecedent inspection, it will rarely veto a recommendation of the superintendent. They have employed the superintendent to recommend the things that ought to be recommended—the things they can approve. They will not employ an executive in whom they can not place confidence. They will certainly never veto a recommendation except when they can give clear reason for doing so.

It is possible for a superintendent occasionally to recommend things that ought not to be done; but the trained, experienced specialist is not likely to make a mistake in simple matters in which the layman's untrained judgment can clearly see that he is wrong. He will make mistakes, if he makes any, in matters that are very complex, and in which there were subtle factors with which he was not at the time sufficiently aware. When he makes a mistake, it will usually be where arguments for and against are, upon the whole, pretty evenly balanced. It will be a matter upon which the board of directors can safely make negative inspectorial decision or veto, only after they have carefully, systematically, and thoroughly assembled the evidence for and against. It is clearly not a place for the offhand judgment of the non-professional layman.

The superintendent will recommend only things for which he can give clear reason. He is employed because he has the educational vision for seeing the educational needs and the reasons for those needs. The board will approve, unless they have clear reason not to approve; and when they disapprove after the assembling of evidence and deliberative judgment, they will state clearly their reasons for such disapproval.

The purpose of the inspectorial supervision is to get the best work done possible. In those very infrequent cases, where the superintendent makes a mistake which they can clearly see, they will point out such mistake by way of preventing a recurrence of it. This is the reason for making clear the ground for every inspectorial veto.

In cases of important questions, like the plans of buildings, the employment and dismissal of teachers and other employees, the adoption of courses of study and text books, etc., where there is serious disagreement between the board of directors and the superintendent, the lay board can scarcely consider itself competent to overrule the deliberative recommendations of its trained executive without securing the previous judgment of some outside disinterested but informed specialist. When board and superintendent can not get together upon such vital questions as those mentioned, a man or a committee of men from one or more of the state educational institutions acceptable to both sides,

should be consulted. There are questions arising of such moment that they would do well to refer them to the highest professional experts in the country. They are especially safe in going to such men for two reasons: (1) These men are the best informed upon the question; (2) Their standing is such that they commit professional suicide by favoring one side at the expense of professional honesty. They will be required to give their reasons, which will be made public for the entire profession to examine. So irreparably will such men injure themselves by professional dishonesty that they are absolutely estopped from giving anything but the most exact professional judgment possible.

In a matter of such serious moment as the continuance of the corps of principals and teachers in the service, as the question comes up in May of each year, if there is serious disagreement between board and superintendent as to what teachers are to be employed, what teachers are not to be employed, what ones are to be placed on probation, etc., the matter is of such profound importance that they can not afford not to refer it to disinterested outside judges for advice and recommendation. A committee of a dozen civic leaders within the city of Denver acceptable to all sides, would, under ordinary circumstances, be satisfactory. If not, it could be carried to such levels of professional advice and recommendation as indicated in the preceding paragraph.

It is not possible to recommend too strongly this way out of the difficulty when such a situation arises as occurred last summer when recently-elected and totally inexperienced board members took the initiative in dismissing, retiring, and placing upon probation more than one hundred teachers and principals. When such action is approved by a competent superintendent and recommended by him upon his own initiative, the board will be safe in adopting his recommendations. If, however, there is disagreement and the city is confronted with such a demoralizing situation as has existed during the current school year, the city must insist that disinterested recommendations be fully considered by all in position of responsibility.

When plans and specifications for new buildings are presented by the superintendent and the assistant superintendent in charge of business affairs, for the antecedent inspectorial approval or disapproval of the board, if after mature consideration, there is serious disagreement between the board on the one hand, and the superintendent upon the other, the matter should certainly be referred to a disinterested committee of architects who are familiar with educational architecture; or it should be referred to one of the two or three school architects hav-

ing the widest national reputation. It is wise business policy and a matter of common occurrence in the business world in the decision of questions of large moment when boards of directors wish further information concerning the recommendations of their executives, to employ a disinterested, consulting specialist for examination of plans submitted. Such good business management is based merely upon good common sense. It should be strictly enforced by the community upon the school authorities.

Men who look upon their work as community service will not only listen with respect when the community expresses its wishes, but will voluntarily and promptly meet all requests half way, except when they can give clear and unmistakable reason why the community is asking for something really harmful to its best interests.

We are here referring to community service as this is defined by men large enough to see broadly all the elements of community welfare. We are not referring to the service of special cliques within the community.

### **Subsequent Inspection.**

After the antecedent inspection and approval by the board of directors, the superintendent with his administrative organization will be given a free hand as to all of the administrative details, subject only to the subsequent inspection of results on the part of the board of directors or of its inspectorial agents.

After the courses of study drawn up by the educational specialists have been examined and approved by the board of directors, the board will thereafter refrain from all interference as to the details involved in carrying out these courses. As methods of reporting upon each kind of instruction are developed in ways recommended, the board will examine the results obtained in the individual buildings. After comparing the results of any given year with the results of previous years, and with the results obtained in other cities, they will approve or disapprove the results. Where they find results which fall below expectations, they will insist that they be brought up to standard, but they will not interfere in the work of bringing them up. This is a matter than can be handled only by the members of the administrative organization.

After building plans have been approved, the board will then leave all details whatsoever to the management of its administrative officials. They will inspect the work subsequent to its performance to see that the results approved in the plans are being secured in the practice. Where results are not being secured, they or their inspectorial agents will point



out the defects to the superintendent and insist that building results be brought up to specifications. They will not, however, interfere in the slightest degree in the details of the work. This belongs to their executives. All they want is to have the work done. It is their business to see that it is done by experts, not to do it themselves.

After the appointment of teachers, principals, engineers, etc., have been approved, the board will leave all of the details of the distribution of the personnel to its executive officials. The latter will assign all employees according to the needs of the work, according to the merits shown by these employees, and according to all special circumstances that have any kind of bearing upon the securing of greater efficiency of service. The school system exists for only one purpose—the effective training of the growing men and women of the city.

If this measures up to standard, the board is doing all for the community that it is commissioned to do. If the educational results are not measuring up to standard, the board will insist that its executive officials do the things that they have been employed to do, but the board will absolutely refrain from mixing in the work in any way. They will have nothing to do with the assignment of teachers, the transfer of teachers, or the detailed labor of teachers, or of any of the other employees within the system. Through review of results and the making of additional demands where results do not come up to standard, the board will get things done, but it will not attempt to do the work itself.

Under such circumstances, superintendent and assistant superintendents are the last people in the world to abuse the confidence that is placed in them. They are familiar with the character of work that is being performed by the teachers. They understand all of the subtle, personal influences that must be completely adjusted before effective service can be possible on the part of teachers. When the responsibility for results is enforced upon these executive people, they simply can not afford to neglect the control of every influence that makes for professional contentment, professional stimulation, and satisfaction on the part of teachers in their professional leadership.

### **Community Inspection of the Board's Labors.**

We have said that the board of directors will periodically require of the superintendent an account of his stewardship. In the same way, the community will require of their representatives, the board of directors, a periodical account of their stewardship.

There is just as much reason for having the labors of the board inspected and supervised by the community as there is for having the

labors of the superintendent inspected and supervised by the board of directors. The community is vitally interested in having the board of directors follow sound principles of good management.

The community should see that the board legislates on the basis of an ample supply of facts, and only after mature deliberation. The community should see that the board does not attempt to perform the labors itself; but that it secure qualified specialists for doing the work. They should then see that the inspectorial labors are fully and effectively performed. They will ask that all important facts, whether legislative or inspectorial, be published in the reports of the school board, and in this way made available for community supervision of the board's labors.

The community will especially demand of the board the reasons for every veto of recommendations of the superintendent. In case of doubt, the community should then exercise its inspectorial duties and see that the points of difference are submitted to disinterested individuals for examination and verification. Just as it is the board's business to keep the superintendent from going wrong, it is equally the community's business to keep the board from going wrong.

It may be objected that the major portion of the community is not qualified so to examine and inspect the labors of the board of directors. It can be said with confidence, however, that there is a very large proportion of the community that is full capable of such inspectorial supervision, and who are sufficiently interested in the civic welfare of the community to perform the necessary labors. It can not be difficult to secure effective service on the part of the educational committees of each of the various city organizations. Such committees can regularly and systematically inspect the facts as these are presented in the reports of the board of directors. These reports, at the present time, are practically undeveloped for any such purpose. But following the recommendations herein made, it is possible to develop them and make them fully serviceable. When facts are not fully forthcoming upon important matters, the community should demand them. The board of directors is performing labors of a representative character only, and all of the facts belong to the community.

We recommend further, that facts be given out for community supervision, not in a large annual report, but in frequent small bulletins, each handling one topic or a related series of topics. Inspectorial facts should not come bunched at one time in the year, leaving the rest of the year barren. They should be distributed rather equally over the entire year. Community interest should be continuous, and not merely



occasional. This interest should be continuously stimulated, and not left to lie fallow through long months of inactivity, or of wrongly directed activity simply because the necessary facts are not at hand.

By gathering up these special bulletins at the end of each year, and binding them into a single volume, the board would have its annual report in compact form.

It is not casting pearls before the unappreciative to give out facts in this way for community supervision. Denver has, in fact, a highly intelligent population. The leaders of the community and an unusually large proportion of the rank and file are fully awake to civic needs. Their judgment is certainly as sound as that of their five special representatives, whose labors it is their civic duty to supervise. They may disagree somewhat among themselves as to what the school district ought to do, but out of disagreement comes discussion, and out of tolerant discussion comes the chief civic education within a democracy. Truth grows up out only of discussion—even though discouragingly slow, sometimes. On the other hand, it can be said with confidence, that out of mental sluggishness it never grows. The growth-pains of civic intelligence within a democracy are not always pleasant. Sometimes it seems as if it would be much better if this intelligence could be made to order, and not slowly have to grow; but the world happens to be so made that civic intelligence can not be made to order and simply handed over to individuals in easy academic ways. In the school field, it is only the discussion of facts of the types we have recommended that can gradually bring about that civic intelligence which is necessary for uninterrupted good management within the school affairs of the district.

During recent months, a number of changes in the legal machinery of the school district have been suggested. Certain further changes could be made with profit; but they are not usually the ones that have been suggested. But as a matter of fact, no legal machinery whatsoever can take the place of community intelligence and public spirit. The best type of governmental mechanism will fail to work if it is not operated by an enlightened public. On the other hand, given this general community enlightenment, even a poor kind of governmental mechanism can be made to bring forth good results. While civic intelligence can get better results out of a superior mechanism, yet it still remains that the community intelligence, not the mechanism, is the principal thing.

One of the most mischievous errors is the common belief that civic machinery can be devised which can serve as a substitute for civic intelligence.

Machinery is always a means—a thing that is operated by intelligence directly or indirectly, and which is kept in repair by intelligence. When the latter is wanting, it can not be properly operated nor kept in a state of proper repair.

The inspectorial labors herein recommended for the community constitute the only possible road to full community enlightenment as regards the schools.

We recommend that the Denver Civic and Commercial Association, Parent-Teacher Associations, Women's Clubs, and all other organizations interested in the greater welfare of a greater Denver, each have a strong educational committee. The duties of such committee should be first inspectorial; and second, advisory to the board of directors as to general educational policies. The board will listen—and heed, where the recommendations are sound. If they do not, then the inspectorial duty of the community is clear.

In this community supervision over general policies, what is to be the position of the professional educational people? They are citizens of Denver. They are public-spirited. They have the welfare of the present city at heart, and also that of the greater Denver which those now in school are to build. They know more about the educational needs than anybody else within the city. Is their knowledge, their courage, and their civic spirit, to be repressed and left unutilized? Constructive civic policies requires the use of all available power within the city, and the repression of none of it.

“But teachers, principals, superintendents, etc., are subordinates,” we are told. “They must have nothing to say as to the decisions of their superiors. Their sole duty is to obey—and be silent. To speak—except to praise—is insubordination.”

This presents a problem of the greatest seriousness in the present situation in Denver—as in all cities. It means repression of the leadership, judgment, and labors of those who best know; of those best fitted for leadership in the community's supervision of its immediate representatives.

Somehow, somewhere, something is left out of the arrangements, when the greatest power for civic promotion of education within the district can not be used. Something needs to be supplied in order that it may be used, and not wasted. **The one thing that democracy can not afford to waste is the power of those who know.**

In so far as there is democracy within the school district, subordination and insubordination will relate solely to the relation of individuals to the community welfare, and not to the relation of individuals to each other. From the point of view of democracy, all the people of

the school organization are **coordinate specialists** in a very real sense, working shoulder to shoulder in the performance of community service.

To the board belongs certain responsible functions that they are best qualified to perform; to the superintendent, certain other specialized services that he is better qualified to perform than anybody else within the system; to the special supervisors and principals, still others; to teachers, others; to janitors and engineers, still others, etc. They do different kinds of work, each doing the kind for which best fitted. In a district that is a democracy, they all stand upon a common level. Simply the work is complicated, and they have to divide it for effectiveness of service. **Each group should be supervisory—from the community service point of view—of the labors of each other group.**

If those that are thus supervised have community service at heart, they will be always glad to have shortcomings of service pointed out by anybody who knows. They will be tolerant. They will not fly in the face of anybody who points out how things can be improved. The “superior” will not try to “get” the “subordinate” when the latter tries to help him improve his specialized type of service.

Insubordination will be failure to serve the community, not failure to obey individuals. It is just as possible for the board members—from this community service point of view—to be insubordinate as for any other individual within the system to be so.

Insubordination to the demands of community welfare should be punished whenever and wherever it arises. In a democracy there can be no other kind of insubordination.

These are the principles of democratic management that Denver feels to be true as the school people speak courageously their minds upon present burning questions relative to the general educational management. We have here only tried to put into words what the community already recognizes. The courage that has been shown by high-minded, educational people within the system is one of the brightest promises for the future. With such leadership the district can not wrongly decide.

In their public pronouncements, teachers will speak through their responsible organizations. There are several sectional organizations among the teachers of Denver. Their most authoritative voice, however, will be that of The Teachers' Council, a central body, small enough for careful deliberation, but consisting of representatives from every teaching and supervisory group.

The sectional organizations and their central council have recently been considering a large variety of educational questions, and taking positions upon them. Since they, along with the superintendent, con-

stitute the most authoritative leaders of the educational sentiment within the community, when they take a stand upon a question they cannot afford to be wrong. They must be right,—as judged on the basis, not of their personal interests, but of the educational welfare of the community. They will, therefore, through committees, be investigators, carefully assembling a great weight of evidence previous to deliberation. Following this method, they cannot often be wrong. And the community can look to their leadership with confidence. Certain valuable types of work that they can perform have been referred to in other portions of the survey reports.

## REPLIES TO OBJECTIONS MADE TO PRELIMINARY RECOMMENDATIONS

Since the preliminary summary of recommendations was issued, many individuals in Denver who have the welfare of the schools at heart, and others, have found themselves in doubt as to certain of the recommendations. While in the body of this report we have attempted to clear up such doubts and difficulties, yet owing to the seriousness of the results of any misunderstanding, we feel warranted in taking up certain of these difficulties and dealing with them one by one. An objection in the minds of the community to principles of business management as applied to the schools represents an aspect of the total educational situation. Since such objections, if common, constitute very substantial obstacles to educational progress, they are factors of the educational situation that require the most careful examination.

### OBJECTION No. 1.

**Since the law places responsibility for the administration of the schools upon the board of directors, they should do the work themselves, and not delegate it to others.**

It is true that the law has placed practically all administrative responsibility upon the board of directors. This does not mean, however, that they are to do all of the work. The school law, for example, says: "Every school board, unless otherwise especially provided by law, shall have power and it shall be their duty . . . to build or remove school houses."

Naturally, this is not to be interpreted literally. The board itself is not expected to build the school houses. Simply, they are to get them built, and to see that the work is done according to specifications. In so doing, they are giving up no responsibility. Simply they are responsible for labors that are highly complicated; labors that they can not perform themselves. So they get it done by qualified specialists.

The labors of training the growing men and women of the city is endlessly more complicated than the merely material labors of constructing a building. The work of accurately fitting text books, supplementary books, supplies, equipment, building arrangements, qualifications of teachers and other employees, etc., to the needs of each training situation is a far more delicate and difficult problem than

that of fitting materials together that make a house. Only the trained specialist can rightly fit together all the factors involved in an educational situation. For this reason, the board will get trained specialists to do it. In proportion as they disinterestedly have the welfare of the community at heart, and disinterestedly want to secure for the community the best possible educational results, they will leave the direction of the work to a strong superintendent. They will not be afraid of educational power in the hands of such a qualified agent. They will rejoice in finding a man who can ably, vigorously, and effectively carry forward the labors of the training. When they want to get things done, they do not want to put their affairs into the hands of a feeble man. Neither do they want to hobble him, by withholding his power over half of the things that enter into the educational situations. Neither will they want to interfere in the work so long as they can see that it is being effectively done by those more capable of doing it than themselves.

When they attempt any of these things, either they are moved by self-interest and have not the welfare of the community disinterestedly at heart, or they are tremendously ignorant of the most effective ways of getting things done. An intelligent community like Denver will trust the welfare of 50,000 youths into the hands of no man possessed of either of these shortcomings.

### OBJECTION No. 2.

**It is unsafe in a democracy to give such large powers into the hands of one man.**

It is not a question of the board giving over its powers into the hands of one man who is then to be left irresponsible. It is a question of business-like division of labor. The one man has no powers but what are delegated to him by legislation; and he is held strictly within the limits set by the board's legislation through the exercise of their inspectorial functions. It is not a question of one-man power; it is a question of how five-men power is to be exercised—whether directly and blunderingly, or indirectly through trained executive agents. Those who honestly express their fear of one-man power are simply uninformed as to those principles of good management that always are to be observed in large organizations where labors are complicated, specialized and difficult.

The labors of a complex and sensitive organization like a school system, can be thoroughly coordinated only when responsibility for the coordination of all of the factors is placed in the hands of a single man.



One mind with comprehensive vision must be at the helm. One mind must see all of the factors and direct all of the major adjustments. Large business organizations never put committees of men at the head of affairs; they get one man to act as president, superintendent, general manager, or whatever he may be termed.

To secure their ends, men usually try to find high-sounding slogans for their use. The one-man power bogey simply can not be used honestly by those who are fully familiar with the principles of good business-like management.

### OBJECTION NO. 3.

**The proposals made are academic, theoretical, visionary, impractical. We want to continue practical administration of the kind that we have had for many years.**

The tables of figures presented in previous discussions and in other sections of the survey, show the kind of practical management that the district has had. The objection assumes that the schools have had good management. The figures reveal management of a different description. Board committees have been so little interested in good management that they have not often even collected and examined such facts as are presented in those tables, to see whether the results of their management were good or not.

The things shown represent practical administration but of an inefficient, undesirable, unscientific type. It is not practical administration of the efficient type. Certainly the city does want administration of a practical character; but it wants efficiency at the same time. The principles of management presented in this report are not visionary merely because they are new to many. The principles of management herein presented are the merest common-places to any business man who is conducting affairs on a large scale. We earnestly urge upon the earnest doubter that he consult with some business man who is handling large affairs and see if the principles employed by such business men are not identical with the principles which we recommend for the management of the people's educational organization.

### OBJECTION No. 4.

**The plan leaves no patronage to dispense.**

For this, 50,000 youth, years hence when they are men and women, will bless a generation that has so preserved them.

## OBJECTION NO. 5.

**The district has elected at popular election a school board to carry on the work. The people do not want the labor turned over to an outsider.**

The superintendent is never an outsider. He becomes a resident of the city, just like the majority of the other people who live within the confines of Denver. As the city develops methods of good management, it will learn the desirability of long tenure in the superintendent's office. This will make him a man of long residence.

But there is a more fundamental thing to be said. Educators constitute a national profession, not a local one. Their field of labor is the nation. They are not outsiders wherever they are employed. All the people are their people. Wherever they work, they work for their own community, because their community is the nation.

## OBJECTION NO. 6.

**The plan leaves no opportunity for securing material rewards for labors performed by an unsalaried board.**

It does not.

## OBJECTION NO. 7.

**Educational people cannot be trusted with the business affairs of educational administration.**

If the community will carefully study the various tables which reveal the character of past business management, they ought not to be afraid of the plans mentioned doing any worse. In too large degree, things have been just happening. The city runs very small risk in at least trying out a plan that has generally proved successful where tried. Nothing will show the fallacy of the above mentioned objection like a practical trial of the plan.

## OBJECTION NO. 8.

**The plan proposed is revolutionary. It threatens the civic integrity of the district.**

This is always the alarm cry of the reactionary, frightened at progress. The objection is based on the assumption that what is old is good, and what is new and progressive is evil. In general, Denver does not believe any such doctrine. When one looks at the restless striving of the city for ever better things—mountain parks, good roads, viaducts, union depot, commercial and industrial establishments, parks, the civic center, city library, new federal building, recently organized

civic and commercial organization, etc.—when the continuing success of all of these movements is rooted in the continuing success of education, one cannot believe that the city wishes to leave the educational department out of the march of progress.

The thing proposed is not revolutionary. It is not new. It is not untried.

#### OBJECTION NO. 9.

**When the board delegates its administrative responsibilities, it becomes a mere rubber-stamp appendage to the superintendent's office.**

One who has read this entire report, can never make this objection again in good faith. The board's legislative and inspectorial duties are endless in extent.

#### OBJECTION NO. 10.

**The survey is an unnecessary and undesirable interference on the part of outsiders. The city ought to work out its problems for itself.**

The second statement is absolutely and eternally true. Only as a city works out its own salvation, can it have any salvation. Never has it been so imperative that people should see with their own eyes, think for themselves, and avoid the unthinking adoption of second-hand judgments. This does not mean, however, that they should not secure suggestions from any source that promises helpfulness. The very thing that we have suggested is that, when presented by any important educational problem whatsoever, every class of citizen within the confines of Denver, who has any interest in the question or any knowledge about it, should have an avenue for the presentation of evidence and for the expression of judgment. This is a matter that has not been sufficiently developed. For the sake of further widening of vision on any problem, those in authority should also secure further suggestions from state university, normal schools, other educational institutions, other city school systems, educational foundations, etc.

Different people in different states and cities living under differing conditions have different experiences in connection with any given educational problem. Each has acquired certain elements of wisdom. A city is a gainer by gathering these crumbs of wisdom from any promising source. Now the educational survey is simply one method of securing suggestions upon important educational problems.

The outsider can often see certain aspects of affairs with clearer vision than the long-time resident. The latter is accustomed to everything within the system. He takes most things uncritically as a matter

of course, because he is used to them, even though they fall far short of what they ought to be. The ideas with which he judges the situation have been moulded too much by that situation itself. The outsider knows infinitely less about the details of the situation. But just because of this he can usually have a clearer vision of the general outlines of affairs. Even if he does not, he at least sees matters from a different point of view, looks at things from out of a different experience, judges them upon the basis of different standards. If he is qualified for the work, he can suggest numerous things which the city will want to look into for itself before his suggestions are adopted.

A survey has certain virtues simply because it is made by men whose ideas and sympathies have not been molded by the special situation that is to be judged.

As to the charge that the survey specialists are outsiders, it is better to look upon them as temporary employes. As such they belong to a profession that is national in its outlook, sympathies, and understanding. They are not alien within any system when they are employed. More and more the school organization is sure to develop methods of cooperation with the universities, colleges and normal schools of the state, and to utilize the services frequently of temporary employes from these institutions.

#### OBJECTION NO. 11.

**The plan recommended is difficult. It requires intelligence. It requires public spirit. It requires the services of grown-up men and women.**

This is true. It is endlessly more difficult than the easy, thoughtless methods of the past; but in proportion as the effort is successfully made, the youth of the city will be the gainers.

#### OBJECTION NO. 12.

**The new by-laws are not in entire accord with the recommendations of the survey.**

The difficulty is not serious. It can be easily remedied by making the by-laws conform to the recommendations of the survey. This will remove the objection. The general recommendations of the survey can not be changed, since based upon accepted principles of good management.

In spirit and intent, the two are in entire agreement. Simply, there are a few additional by-laws needed. They will then be as completely in accord in letter as they now are in spirit and intent.

## COMPARATIVE SUMMARY OF THE PRINCIPLES OF GOOD MANAGEMENT

The people of the district need to understand that there is not one set of principles of business management applicable to a business corporation and another different set applicable to the school corporation. Both kinds of corporations are subject to exactly the same laws of good management. What brings success to the one will bring success to the other. What brings failure in the one will bring failure in the other.

Since this is vital for current consideration of present proposals, let us present for comparison the steps and processes, upon the one hand, involved in establishing and operating a large business corporation, employing 1,200 men and women; and upon the other hand, the steps and processes similarly involved in establishing and operating a school corporation employing another 1,200 men and women. Let us set down the two, in parallel columns, one over against the other.

### **Manufacturing Corporation Employing 1,200 People.**

#### I.

The owners, called stockholders, select a board of directors, whose function is solely representative. Their only duty is to serve the best interests of those whom they represent.

#### II.

The stockholders are laymen with respect to the specialized labors to be performed; and the directors are also laymen. Neither stockholders nor directors are familiar with the specialized technique involved in the work. They do know the results that they want, and they know there are men who are familiar with all of the technical processes involved in getting these results. They employ, therefore, a trained and experienced specialist of this character, the strongest that they can find, for their executive. They call him their general manager.

### **School Corporation Employing 1,200 People.**

#### I.

The owners, called citizens, select a board of directors, whose function is solely representative. Their only duty is to serve the best interests of those whom they represent.

#### II.

The citizens are laymen with respect to the specialized labors to be performed; and the directors are also laymen. Neither citizens nor directors are familiar with the specialized technique involved in the work. They do know the results that they want and they know there are men who are familiar with all of the technical processes involved in getting these results. They employ, therefore, a trained and experienced specialist of this character, the strongest that they can find, for their executive. They call him their general superintendent.

## III.

The board of directors, after careful consideration of conditions and possibilities, and in constant consultation with their executive, make decision and announce to their executive the general policies that they wish adhered to.

## IV.

The executive draws up detailed plans for every department of the work. This covers the general form of organization of the personnel to be employed, and the series of processes to be performed in each department. The plans will show:

- The number of assistant managers.
- The duties of assistant managers.
- Special departmental heads.
- Specialists in technical processes.
- The foremen to be employed.
- The number and types of workmen.
- The duties to be assigned to each.
- The series of processes to be performed.
- Buildings needed, and the building plans demanded by the work and the exact building equipment for the work.
- The machinery and other equipment that will exactly serve for the best type of work.

## V.

The board of directors will consider the detailed plans presented by their executive to see so far as they can whether the plans conform to the general policies adopted. If they do conform, they approve. If they do not conform, they point out the divergencies, and ask their executive to make amendments in his plans. This process will continue until the detailed plans conform to general policies.

If during this process there is serious disagreement between board and executive, the board will call in a competent consulting specialist, whose competence can be approved by their executive, to advise with them.

## III.

The board of directors, after careful consideration of conditions and possibilities and in constant consultation with their executive, make decision and announce to their executive the general policies that they wish adhered to.

## IV.

The executive draws up detailed plans for every department of the work. This covers the general form of organization of the personnel to be employed, and the series of processes to be performed in each department. The plans will show:

- The number of assistant superintendents.
- The duties of assistant superintendents.
- Special departmental heads.
- Special supervisors.
- The principals to be employed.
- The number and types of teachers, engineers, etc.
- The duties to be assigned to each.
- Courses of study and methods of procedure.
- Buildings needed, and the building plans demanded by the work and the exact building equipment for the work.
- The text-books, library and supplementary books, supplies, shop equipment, furniture, etc., that will exactly serve for the best type of work.

## V.

The board of directors will consider the detailed plans presented by their executive to see so far as they can whether the plans conform to the general policies adopted. If they do conform, they approve. If they do not conform, they point out the divergencies, and ask their executive to make amendments in his plans.

This process will continue until the detailed plans conform to general policies.

If during this process, there is serious disagreement between board and executive, the board will call in a competent consulting specialist, whose competence can be approved by their executive, to advise with them.



## VI.

The general manager will nominate men for his assistants and for his major departmental heads. The board may or may not pass upon these nominations before the men are employed. If the board is assured of the competence of its executive, it knows that he can choose these departmental heads with greater assurance of good judgment than can they. They realize that they cannot even pass rationally upon his nominations without the aid of independent competent consulting specialists. They have placed the responsibility upon their general manager for results. They will never hamper him by refusing the men he wants, unless there is incontestable proof of the unfitness of these men. His recommendation of such men is proof of his unfitness. The board will therefore never, or practically never, veto a nomination made by their general manager. Always when they are called upon to exercise such veto they must consider whether they do not need a new general manager.

## VII.

The general manager, in consultation with his assistants, department heads, and specialists in processes, employs foremen and workmen.

The board of directors does not pass on these nominations. It is a principle of business management that responsibility is actually placed upon general manager and department heads only insofar as they are given full control over all the means to be employed in doing the work. The qualifications of foremen and workmen constitute one of the most important of the means that is to be placed under the full control of the overhead management, as they are commissioned to get results. Neither the stockholders nor the board of directors care who does the work. Simply they want it done, and done well. It is not a principle of business management for the board of directors

## VI.

The superintendent will nominate men for his assistants and for his major departmental heads. The board will exercise its rights and duties of antecedent inspection of these nominations before appointments are made. This is to make assurance doubly sure. If the board is assured, however, of the competence of its executive, it knows that he can choose these departmental heads with greater assurance of good judgment than can they. They realize that they cannot even pass rationally upon his nominations without the aid of independent competent consulting specialists. They have placed the responsibility upon their superintendent for results. They will never hamper him by refusing the men he wants, unless there is incontestable proof of the unfitness of these men. His recommendation of such men is proof of his unfitness. The board will, therefore, never, or practically never, veto a nomination made by their superintendent. Always when they are called upon to exercise such veto they must consider whether they do not need a new superintendent.

## VII.

The superintendent, in consultation with his assistants, department heads, and special supervisors, nominates principals, teachers, janitors, engineers, physicians, nurses, clerks, etc.

Again to make assurance doubly sure that no mistake is made, the board exercises its antecedent inspectorial powers and approves or disapproves all nominations before appointment is made. The board conforms to the cardinal principle of business management, stated opposite, by never vetoing a nomination made by their superintendent unless there is evident and incontestable proof of unfitness on the part of the one nominated, as approved by by a competent consulting specialist called in to advise the board where doubts have arisen as to the competence of their superintendent's ability to nominate.

## VII—Continued.

to approve the names of the individual workmen who are to be employed.

They do not consider even the possibility of a veto.

## VIII.

The board of directors places at the disposal of their general manager all funds needed for the conduct of the work as embodied in the budget drawn up by their executive on the basis of the plans of work approved by the board. The expenditure of the itemized funds of the budget is left to the general manager and his assistants. Only in matters of large moment will the board use its privilege of antecedent inspection of budgetary expenditures.

## IX.

The general manager and his corps will do the work according to the plans and specifications approved by the board. They will operate and control all the means that have been placed at their disposal by the board.

The board will not interfere in any of the acts on the part of any members of the factory organization.

## X.

At stated intervals the board of directors will require of its general manager an account of his stewardship. They will ask for reports on finance, equipment, materials purchased, materials consumed, materials on hand, stock manufactured and sold, stock on hand, cost-accounting in the various departments, efficiency reports, etc.

The board will examine these reports, and compare them year after year; compare them with similar reports of other factories if such are obtainable, etc.

If as judged by these comparisons, the board is satisfied as to results, they will ask that the work continue as it has been going. They will not demand improvements, though they will encourage inventions and discoveries that look to improvement. With things thus going well, they will place all possible power in the hands of their general manager,

## VII—Continued.

At the same session they will consider the advisability of employing a stronger superintendent in whose recommendations they can place confidence.

## VIII.

The board of directors places at the disposal of their superintendent all funds needed for the conduct of the work as embodied in the budget drawn up by their executive on the basis of the plans of work approved by the board. The expenditure of the itemized funds of the budget is left to the superintendent and his assistants. Only in matters of large moment will the board use its privilege of antecedent inspection of budgetary expenditures.

## IX.

The superintendent and his corps will do the work according to the plans and specifications approved by the board. They will operate and control all the means that have been placed at their disposal by the board.

The board will not interfere in any of the acts on the part of any members of the school organization.

## X.

At stated intervals the board of directors will require of its superintendent an account of his stewardship. They will ask for reports on finance, equipment, materials purchased, materials consumed, materials on hand, instructional results, attendance, promotions, failures, graduates, cost-accounting in the various departments, efficiency reports, etc.

The board will examine these reports, and compare them year after year; compare them school with school and with corresponding reports from other cities.

If, as judged by these comparisons, the board is satisfied as to results, they will ask that the work continue as it has been going. They will not demand improvements, though they will encourage inventions and discoveries that look to improvement. With things thus going well, they will place all pos-

## X—Continued.

so that he can improve the work if he can find the means.

When the board finds shortcomings revealed in the reports, they will demand explanations that explain. If satisfactory, they ask for recommendations from their general manager as to changes needed in general policy or in the details of policy. They will grant what is needed if it promises remedy; they will back up his labors as fully as they can, and then they will stand aside and let him bear the responsibility for results.

If he fails again, or if his first failure was serious, after having been given sufficient time and sufficient power for success, the board of directors will let him go; and they will take on a new general manager.

Their policy must be to dismiss the weak man, and to hold on to the strong man.

## XI.

At stated times, or at any time when conditions appear to demand it, the stockholders will require of their representative board of directors an account of their stewardship.

They will ask for reports as to the general policies followed, the reason for these policies wherever serious questions may arise, and for all inspectorial reports of all kinds enumerated in the foregoing section.

This practice is not universal yet in the business world—not even common. But it is growing in extent and frequency, and is recognized as a necessary principle of sound management when the management is intended efficiently to serve the interests of the stockholders.

If the stockholders approve, they will sustain their board in all of its acts. They will give it all the support that they can.

If the stockholders disapprove, they will ask for changes in the matters disapproved. The board will make itself cognizant of their wishes as fully as possible, accept all means placed at their

## X—Continued.

sible power in the hands of their superintendent, so that he can improve the work if he can find the means.

When the board finds shortcomings revealed in the reports, they will demand explanations that explain. If satisfactory, they ask for recommendations from their superintendent as to changes needed in general policy or in the details of policy. They will grant what is needed if it promises remedy, they will back up his labors as fully as they can, and then they will stand aside and let him bear the responsibility for results.

If he fails again, or if his first failure was serious, after having been given sufficient time and sufficient power for success, the board of directors will let him go; and they will take on a new superintendent.

Their policy must be to dismiss the weak man, and to hold on to the strong man.

## XI.

At stated times, or at any time when conditions appear to demand it, the citizens will require of their representative board of directors an account of their stewardship.

They will ask for reports as to the general policies followed, the reasons for these policies wherever serious question may arise, and for all inspectorial reports of the kinds enumerated in the foregoing section.

This practice is not universal yet in community supervision of their boards of school directors. It is not even common. But it is growing in extent and frequency, and is recognized as a necessary principle of sound management when the management is intended efficiently to serve the interests of the citizens.

If the citizens approve, they will sustain their board in all of its acts. They will give it all the support that they can.

If the citizens disapprove, they will ask for changes in the matters disapproved. The board will make itself cognizant of their wishes as fully as

## XI—Continued.

disposal for the improvement in the work, and inaugurate the new policies required or make the necessary amendments to the old.

If after the wishes of the stockholders are made known to the board, the latter continue negligent or derelict, or if their failure to serve the best interests of the stockholders has been serious, they will be promptly relieved of their stewardship and more faithful representatives placed in their stead. The policy of the stockholders must be to relieve only those who prove negligent or unfaithful. They must not dispense with experience of the right sort. But unfaithful directors will be relieved of their responsibilities.

They will hold on to the services of faithful board members to the last extremity.

## XI—Continued.

possible, accept all means placed at their disposal for the improvement in the work, and inaugurate the new policies required or make the necessary amendments to the old.

If after the wishes of the citizens are made known to the board, the latter continue negligent or derelict, or if their failure to serve the best interests of the citizens has been serious, they will be promptly relieved of their stewardship and more faithful representatives placed in their stead. The policy of the citizens must be to relieve only those who prove negligent or unfaithful. They must not dispense with experience of the right sort. But unfaithful directors will be relieved of their responsibilities.

They will hold on to the services of faithful board members to the last extremity.

When it is asserted that educational management must in its general outlines be different from good business management, it can be shown from such a parallel study that there is absolutely no validity to the contention. All kinds of large organizations, whether commercial, civic, industrial, governmental, educational, or other, are all equally and irrevocably subject to the same general laws of good management.

# **REPORT OF THE SCHOOL SURVEY**

of

**School District Number One**

**In the City and County of**

**DENVER**

---

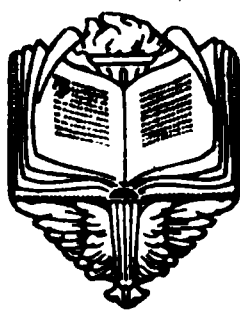
## **Part II**

### **THE WORK OF THE SCHOOLS**

**Elementary Schools. By Franklin Bobbitt**

**High Schools. By Charles H. Judd**

*The University of Chicago*



**The School Survey Committee**

**Denver, Colorado**

**1916**

## HIGH SCHOOLS

	Page
I. GENERAL COMPARISON .....	133
High Schools Are Very Different in Equipment and Organization...	133
Influence of the East Side High School.....	133
Experiment of Separating Academic Courses from Manual Courses..	135
West Side High School.....	136
North Side High School.....	136
South Side High School .....	136
The Latin School.....	137
Longfellow School .....	137
Strong Characteristics of the Schools.....	137
II. MATERIAL EQUIPMENT .....	139
Equipment for Physical Education.....	139
Luncheon Arrangements .....	144
Material Equipment for Literary Courses.....	147
East Side High School.....	147
North Side High School.....	148
South Side High School.....	148
West Side High School.....	148
Manual Training High School.....	148
Domestic Science .....	149
III. INTERNAL ORGANIZATION .....	151
Student Population .....	151
The Success of Students in Courses.....	157
Meetings of Teachers of Mathematics Department, North Side High School .....	160
Course of Study.....	162
Vocational Guidance .....	166
Methods of Instruction.....	167
IV. RELATIONS BETWEEN THE HIGH SCHOOLS AND THE ELEMEN- TARY SCHOOLS .....	168



379.77  
C 4  
A 4  
S 4  
MAR 10 1919

**REPORT OF THE**

*Denver* **SCHOOL SURVEY**

of

**School District Number One**

**In the City and County of**

**DENVER**

---

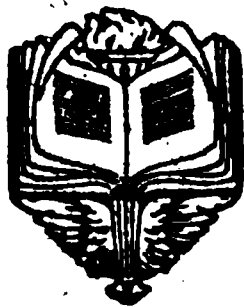
**Part II**

**THE WORK OF THE SCHOOLS**

**Elementary Schools. By Franklin Bobbitt**

**High Schools. By Charles H. Judd**

*The University of Chicago*



**The School Survey Committee**

**Denver, Colorado**

**1916**



## I

## THE GENERAL SITUATION

The school situation in Denver as regards instruction and the conditions of instruction presents a singularly mixed appearance. The numerous things that make up the system have developed very unevenly. One finds developments that are abreast of the very best that is done anywhere in the country. On the other hand, one finds features that belong back in the last quarter of the nineteenth century. Scattered along the whole scale between these two extremes one finds most of the features of the present school system.

Such matters as the following indicate that the Denver schools are essentially of the progressive type:

1. Vocational training for both boys and girls begins early in the elementary school and continues to full specialization in certain trades. Few cities are making relatively a larger expenditure for training along manual and vocational lines.

2. Kindergarten training has been given in the public schools for more than twenty years. Kindergarten classes are to be found at present in practically every building having pupils enough to warrant the formation of a class.

3. Auditoriums and gymnasiums for school and community are being constructed in all new buildings.

4. Supervised play before and after school hours is provided on the majority of the playgrounds of the city. It is also taken care of during the summer vacation in connection with the school playgrounds and the city parks.

5. Both medical and dental inspection are provided for all of the pupils of the city.

6. Open-air rooms of modern type are being provided in the newer buildings of the city.

7. Special types of children are being taken care of in special classes. Provision has been made for taking care of the retarded, the subnormal, and the specially bright pupils who can be aided in making specially rapid progress.

8. Arrangements have been made whereby free public library service is furnished the public schools.

9. Active Parent-Teacher Associations are to be found in connection with the majority of the schools.

10. Both the elementary and secondary evening schools have been established to take care of the needs of a variety of social classes.

11. Specialized commercial training is offered in the eighth grade of a number of the elementary schools and in all of the high schools.

12. Textbooks for many years have been purchased at public expense.

13. Departmental teaching is employed in the later grades of the elementary schools.

14. The city is rather fully equipped with supervisors of special subjects.

15. A retirement system is provided for superannuated and incapacitated teachers, which is drawn up along good lines.

16. As compared with cities of the population class of Denver, teachers' salary schedules, both elementary and secondary, are reasonably liberal.

17. The city has drawn its teaching and supervisory staff from all parts of the country, and is thus in a position to avail itself of a great diversity of educational suggestions brought from other states and cities.

18. The list could be greatly extended.

It would be possible to enumerate an equal number of vital things in which the city is backward. Indeed, quite a number of these progressive movements have been very inadequately worked out as yet in their details. To the various shortcomings observed, extended attention is given in this and the other survey reports. There can be no practical value in our dwelling at length upon the strong points and the successful achievements. A city that is able to bring them about is able to recognize them and to realize their worth.

A constructive program that looks to improvement must involve a careful examination of those places where improvements can be made. It must look mainly to growth that has not yet been accomplished. One type of task in drawing up an effective constructive program, therefore, must necessarily be the rather thankless and disagreeable one of critically pointing out shortcomings—or, as better phrased perhaps—pointing out developments that have not yet been made, but which constitute the natural “next steps” in the progressive evolution of a twentieth century school system. We point to defects only as a means of suggesting ways of eliminating those defects.

Findings are based upon facts gathered during the late autumn of 1915, just as the newly elected superintendent was getting a hold upon the situation and before conditions had allowed him opportunity to effect important changes in instructional plans and policies. It was an auspicious time for a survey, since the responsibility for conditions found rested not upon the new superintendent, but upon previous administrations; and recommendations could serve as suggestions at least to be considered in formulating the new policies that should now be inaugurated.

The report having been somewhat delayed, it is possible that a number of the changes herein recommended are already well under way.

## II

## READING, LITERATURE AND MEMORY WORK

The portion of the total elementary school time devoted to this subject is about 16 per cent. This is slightly less than the average of 17 per cent for cities in general. In Denver, as in all cities, the subject is regarded as the most important one in the elementary schools. ✓

The total annual expenditure for the elementary schools is at present in the neighborhood of \$1,250,000. Since 16 per cent of the total investment is for the reading and literature, the city is annually investing in this subject on the elementary level approximately \$200,000.

The question before the city is: Are the fullest possible returns being secured upon this investment?

It is possible to make some estimate by finding answers to these questions:

1. Have the schools carefully defined their purpose in teaching of reading so that they know exactly what results they are after?
2. Are the purposes the proper ones?
3. Are the purposes made conscious *previous* to choosing the reading materials and devising the methods of work?
4. Are the reading materials then chosen so as exactly to fit the purposes to be served?
5. Are methods of work definitely fitted to the purposes to be served?
6. Are the needed reading materials available in every school?

Since the city is investing a full \$1,000,000 in the teaching of this subject every five years, we feel that we shall be justified in discussing the situation in some detail. If 10 per cent of the present investment in reading pays for wasted labor and opportunity—and this is a safe assumption in any city—the possible saving is worth trying for.

## Purposes

In order to learn teachers' valuations, and their conception of purposes, they were asked to name the two reading selections that had been used during the current term which they considered most profitable for the pupils. They were given a week for deliberation. One teacher

named two simple stories like "The Legend of the Moor's Legacy," and "The Fencing Match." A second teacher said: "We have read 'Evangeline,' and are now completing 'The Story of the Great Republic' and 'Carpenter's Geographical Reader of Europe.'" A third teacher mentioned two poems; a fourth, two patriotic selections; a fifth showed her special inclinations by naming two historical selections.

In degree of difficulty, and perhaps in certain other ways, the selections should be somewhat different in different buildings, according to the social character of the population. But basic values are much the same for all the children of the city. If historical and geographical readings are most valuable for a considerable number of the schools, it is probable that they are the most valuable for at least the majority of the schools. But there is no such majority opinion to be discerned in the replies of the teachers. If merely recreational stories like "The Legend of the Moor's Legacy" are the most valuable for the children of many schools, then it is probable that they are the most valuable for the majority of the schools. But in favor of this opinion no such majority opinion is discernible. All sorts of things are chosen in all sorts of combinations. There is no agreement as to valuations.

This freedom of the teachers to choose the selections to be used is an excellent thing that should be continued; but it is unsafe to give such freedom to teachers except as they are at the same time brought to understand basic valuations and the principles of judgment necessary for wise use of their freedom. The very purpose of this freedom is that they may be untrammelled in making application of such principles to their special problems. But they must have the principles clearly in mind before they can make application of them. There are more ways of going wrong than going right. Liberty without such controlling principles will result in wrong judgments, more often than in right ones. The result is waste of time, of money, and of the children's opportunity.

So far as could be ascertained, the school people are not systematically and co-operatively trying to determine the fundamental bases of valuation for the different kinds of reading employed. Until this is done, the wastes will continue. Of course, a poor or unsuitable selection may serve for training in the mechanics of reading. It cannot, however, serve as the best training in the mechanics of reading; and it neglects other values that schools nowadays cannot afford to neglect.

For the earlier grades of the elementary school, the school people are agreed as to the purposes of the work. It is to give to the pupils a tool that can be used later for the acquisition of knowledge; power to gain thought from the printed page; ease, facility and naturalness of good oral reading; a desire to read good literature adapted to the maturity of the pupils; and a habit of such reading.



The purposes of the reading work most frequently mentioned by teachers of the later grades of the elementary school are:

Ability to gain thought from the printed page.

Enlargement of the child's understanding.

The reading habit as a desirable leisure occupation.

Rapid, intelligent, and appreciative silent reading.

Knowledge of current happenings in the world:

Accurate pronunciation of words.

Habit of using the dictionary.

Ease and naturalness in the presence of an audience.

Effectiveness in presenting thought to an audience.

Enlargement of the vocabulary.

Ability to find information on any topic.

Character building.

Admiration of the great characters of literature, history, etc.

A widened vision of the world and deepened human sympathies.

An understanding of literary forms, and an appreciation of good literary style.

There are no legitimate purposes of training in reading that are not already understood by teachers in Denver. But whether one takes the teachers' statements, or whether one judges from observation of practice in the classrooms, it is clear that in the actual work, one teacher is using one set of purposes and another teacher is using another set. There are all kinds of combinations, the great majority of which have been adopted on the basis of very insufficient deliberation.

The thing needed is a careful consideration on the part of all of the school people as to the purposes that should control. No one of the above purposes should be lost sight of. Certain ones, however, must be made paramount, and the others made to fit into the plan that in its basic outlines is determined by the few major purposes.

"The purpose of teaching reading is an enlarged understanding of the complex world in which one lives," says one Denver teacher. Those in the school system who accept this as the basic purpose ask for a large variety and quantity of reading materials. They need books, magazines and newspapers, which reveal industry, commerce, transportation, mining, agriculture, etc., as these exist in the various portions of the world. They need well-written geographical materials, travels, lives of people in other lands, etc., for giving vision of the current world. They need historical readings, biography, stories of great men and great peoples, etc., by way of giving a vision of the creative forces concerned in the making of present conditions. They need stories of inventions and of the application of science to human problems. They need readings that will reveal the nature of family life, religious life, recreations, general mode of living, etc., in the various important countries of the

world. Rightly to understand peoples, present or past, it is necessary also to enter into the thought and emotional life of these peoples. Hence, there are needed readings called literature in its narrower sense: essays, speeches, poems, novels, dramas, anecdotes and humor, myth and legend, story and song.

Such a purpose is all-comprehensive. Making it central, the various purposes will find a proper place and a proper emphasis. It takes care of the mechanics of reading, since pupils will get that fullness and variety of practice needed for easy, rapid reading. It takes care of the thought side as well. Nothing vital is left out. Every good thing is given vitality of the right type.

"The purpose of the training in reading is to give the pupils the power of easy, fluent, correct and expressive oral reading," says another Denver teacher. The purpose is a legitimate one, and ought to be taken care of in proper degree in the reading training. It is a far narrower purpose, however, and fails to take care of many things urgently demanded by present-day conditions. It makes no demands for varied and abundant readings concerning industry, commerce, mining, agriculture, geographical situations, historical developments, manners and customs, lives of people in various lands, nor for any comprehensive and varied understanding of the thought-life of man. A repertory of interesting stories and poems is all that is required. School readers of the usual type sufficiently serve the purpose. For further practice almost any sort of interesting supplementary book will do. *Arabian Nights* is on a par with stories of industry or the historical stories of the building of our nation. The things read are not chosen for their content value.

The things aimed at tend to be purely formal. In the words of one of the Denver teachers: "Each pupil called upon to read is required to stand well, holding book in the left hand, leaving the right free to turn pages—to face either the teacher or class according to his location in the recitation room, which location is altered from time to time in order to accustom him to face his audience and give him ease; to glance up at his audience at full stops; to keep his voice from dropping at commas; to read with expression and clearness and correct speed. He is called upon to define difficult words, phrases, sentences, or to explain the entire paragraph or paragraphs read. Others are asked to supplement this if not full enough. Much care is taken to correct the habit of miscalling small words—that worst of habits in reading. (I stop the pupil but do not point out his blunder.) If better expression is possible than that given, I read the portion myself, either asking him to re-read it or calling upon another pupil to do so. Much is said to impress upon the mind of the pupil the beauty of the extract; to get at, as far as possible in a limited time, the meaning of the author—his choice of words, etc., and to work up a firmness of expression."

These are mostly proper things in themselves, but when they become the conscious ends of the training, more important things are lost sight of and they themselves are taken care of in a less effective manner than if they found their rightful place in a more comprehensive plan.

Certain teachers have discovered the large place that silent reading plays in life outside of the school, and are coming to adjust their methods and their materials so as to train more fully for silent reading. As a matter of fact there is not much oral reading at the present time on the part of adults, but there is an enormous amount and an ever-growing amount of silent reading. Naturally students get a good deal of practice in this during their study periods in connection with all of their subjects. In general, however, assigned lessons in textbooks are so short and difficult that they do not secure a large amount of rapid silent reading. It is desirable, however, that people be able to gain thought silently from the printed page rapidly, easily and fully. Attention should be given by the school authorities to the possibilities and the needs of training in silent reading.

It is generally agreed that one learns to do a thing by doing it; that he learns to do it well by doing it much and often; that he learns to do it rapidly by doing it rapidly.

This obvious common-sense principle is vital in the training in reading. It means two things in the work: (1) Pupils are to be trained by doing much rapid reading; (2) the books, newspapers and magazines must be available. If the all-comprehensive purpose referred to is the one to make central, these reading materials should be of a varied character, dealing with all important aspects of human life.

Reading materials for practice are now supplied to pupils in five ways: 1. Reading textbooks; 2. Supplementary books, furnished in sets; 3. School library books; 4. City public library; 5. Home libraries.

## 1. Textbooks

Each primary grade has three or four texts for the year's work. From the third grade through the eighth, each grade has assigned to it two textbooks for the year.

The texts chosen are widely used throughout the country and are of good average quality, as texts go.

The day is past, however, when reading textbooks of the usual type can serve the varied purposes of teaching reading. Even on the side of the mechanics of reading it is being discovered that one should read abundantly and rapidly. For taking care of those aspects of education dependent upon the thought content of the reading, it is clearly indispensable that reading be copious, and thus permit the whole world in

its multifarious aspects to pass in review before the intellectual gaze of the pupils.

The textbook selections are not chosen, on the whole, for rapid and abundant reading experience. They are chosen on the presupposition that the whole year will be given to the textbook alone. The selections are usually, therefore, on the whole rather difficult, and do not give up their meaning without considerable labor and discussion. In a very large proportion of the cases the difficulty is brought about by choosing readings which express adult and sophisticated sentiments. Sometimes it is a difficult vocabulary, but this is not a serious obstacle where the thought is on a level with the children's degree of maturity. The really serious difficulties are experienced in the not rare cases where there is a combination of adult sentiments, of literary subtleties, and of unfamiliar vocabulary. It is a thoroughly vicious type of educational procedure to set children to work upon such inappropriate reading material. It is unavoidable, however, where the texts are made the sole or chief basis of the work. The remedy is that shown in the best work in Denver where the so-called supplementary sets have been made the basis of the chief training in reading and the texts made supplementary.

### Supplementary Reading Sets

Whether the supplementary reading now in possession of the school system is sufficient for reading purposes, and whether it is of right quality and selection for such purposes, all depends upon what those reading purposes are. In our discussion here we are assuming twentieth century purposes and valuations. We are also looking at all of the non-textbook reading of the school, not merely that of the reading classes proper. Whatever the subject, the reading of the books is reading practice.

The educational diet supplied third grades in addition to the textbooks is mainly shown in the following list. The table shows all titles found in more than ten buildings:

#### Supplementary Reading Supplied Third Grades

TITLE—	Number of Schools Having a Set
Cyr Third Reader.....	42
Silver Burdett Third Reader.....	40
Baldwin Third Reader.....	33
Heath Third Reader.....	27
Mother Goose Village.....	20
Early Cave Men.....	19

On an average each building has for third grade use 1.4 other sets ranging over thirty-eight scattered titles. The choices would indicate that the end is practice in the mechanics of reading.

The courses of study of fifty large American cities show that the

following are the most used supplementary books for third grade work. They are presented for comparison:

	Of the Fifty Cities
Seven Little Sisters.....	29
Adventures of a Brownie.....	23
Animal Life .....	17
Little Folks of Many Lands.....	15
Merry Animal Tales.....	14
Book of Folk Stories.....	14
That's Why Stories.....	13
Children of the Wigwam.....	13
Ab, the Cave Man.....	12
Child's Garden of Verses.....	12
Mother Goose Village.....	12
Nature Myths and Stories.....	12
Legends of the Red Children.....	12
Little Folks of Other Lands.....	11

Cities in general probably have studied the purposes involved little more than Denver, but current practice, as shown in this list, seems to reveal a growing tendency to use reading of a varied character: geography, history, animal science, general science, poetry, myth, legend and adventure. Denver would do well to consider the propriety of offering the third grade pupils some such variety of reading opportunity.

The mental diet which in the main, in addition to textbooks, is supplied fourth grades is shown by the following list of supplementary books to be found in ten buildings or more:

#### Supplementary Reading Supplied Fourth Grades

TITLE—	Number of Schools Having a Set
Cyr Fourth Reader.....	50
Silver Burdett Fourth Reader.....	34
Baldwin Fourth Reader.....	32
Heath Fourth Reader.....	30
Legends of the Red Children.....	19
White Patch .....	15

Each building has on an average 1.4 other sets for fourth grade use distributed over forty other titles. Except for one of the sets commonly found, and for the scattered sets found in a few buildings, it appears that choice of fourth grade reading materials has not involved consideration of any complete range of educational purposes. That choices might well be different, note the practices of fifty cities:

	Of the Fifty Cities
Fifty Famous Stories.....	41
Black Beauty .....	29
Alice's Adventures in Wonderland.....	28
Great Americans for Little Americans.....	28
Anderson's Fairy Tales.....	26
Arabian Nights.....	21
America's Story .....	21
Big and Little People of Other Lands.....	21
All the Year Round.....	16
Children of the Cold.....	14
In the Animal World.....	14
The World and Its People.....	13
Folk Stories and Fables.....	13
Our Birds and Their Nestlings.....	12
American Life and Adventures.....	12

Fifth grade reading diet generally supplied in addition to textbooks is as follows:

TITLE—	Number of Schools with Sets
Carpenter's North America.....	Most
Carpenter's South America.....	Most
Baldwin Fifth Reader.....	36
Silver Burdett Fifth Reader.....	31
Heath Fifth Reader.....	16
Stepping Stones Fifth Reader.....	15
Moni, The Goat Boy.....	12
Basket Women .....	9
King of the Golden River.....	8
Story of Our Country.....	7

In addition to these the buildings have an average of 1.6 sets distributed over fifty-two titles. Except for the geographical readers that are very difficult for this grade, and except for the discarded reading texts now used as supplementary books, no set of books is to be found in more than a quarter of the buildings. Why is the education of the children in the favored buildings to be considered so much more important than that of the children in buildings not so favored? Or is the presence or absence of books of this nature of so little importance that it can be neglected? It is the judgment of the writer that the city here has been pursuing a short-sighted, wasteful and mistaken policy.

Other cities are using such books as the following for the fifth grade:

	Of the Fifty Cities
King of the Golden River.....	34
Old Greek Stories.....	23
Little Lame Prince.....	22
King Arthur and His Knights.....	22
American History Stories.....	20
Lobo, Rag, and Vixen.....	20
First Book in American History.....	17
Jackanapes .....	17
Home Geography .....	17
Alice's Visit to Hawaiian Islands.....	17
Bird's Christmas Carol.....	17
Founders of Our Country.....	14
Stories of Industry.....	13
Four Great Americans.....	13
Story of Columbus.....	13
Old Stories of the East.....	12

The intellectual opportunity supplied the sixth grade in Denver in addition to textbooks is mainly represented by the following list:

TITLE—	Number of Schools with Sets
Carpenter's Europe .....	Most
Carpenter's Asia .....	Most
Baldwin Sixth Reader.....	27
Story of the Thirteen Colonies.....	23
Swiss Family Robinson.....	17
Heidi .....	15
Stepping Stones to Literature.....	15
Trees and Peaks.....	9
Old Greek Stories.....	8
Norse Stories .....	6



Each building has an average of 1.5 sets additional scattered over forty-five different titles. It will be observed that excepting for the geographical readers most buildings are unsupplied with the best of these sixth grade volumes. The judgment of cities in general is represented by such commonly used books as the following:

	Of the Fifty Cities
Jungle Book .....	30
Merry Adventures of Robin Hood.....	24
Norse Stories .....	23
Wonder Book .....	20
Uncle Remus .....	19
Heidi .....	19
Tanglewood Tales .....	18
Ways of Wood Folk.....	18
American Heroes of History.....	18
Dog of Flanders.....	18
Brooks and Brook Basins.....	16
Homeric Stories .....	15
Story of the Thirteen Colonies.....	14
Krag and Johnny Bear.....	14
Stories of Industry.....	13
Great American Industries.....	13
Famous Men of Greece.....	11
Story of Ulysses.....	10

Seventh grade reading opportunities are not extensive. Pupils have reached an age when in their reading, the whole world should pass in review before them. Here is what the schools have to offer this grade in addition to their textbooks:

TITLE—	Number of Schools with Sets
Carpenter's Africa .....	..
Carpenter's Australia .....	..
Baldwin's Seventh Reader.....	30
Evangeline .....	23
Miles Standish .....	21
Story of the Great Republic.....	20
King Arthur .....	13
Christmas Carol .....	11
Snow Bound .....	9
Stepping Stones to Literature.....	9
Story of the Thirteen Colonies.....	7

The buildings average an additional 1.3 sets scattered over fifty-two titles. Of the sets most commonly found, it will be observed that the majority of buildings are not supplied.

In the fifty other cities books commonly used in the seventh grade are:

	Of the Fifty Cities
Carpenter's Geographical Readers.....	44
Tales from Shakespeare.....	28
American Hero Stories.....	25
Grandfather's Chair .....	21
Lives of the Hunted.....	19
A-Hunting of the Deer.....	19
Adventures of Ulysses.....	17
Miles Standish .....	17
Treasure Island .....	17
Little Men .....	16
Little Women .....	16

	Of the Fifty Cities
Birds and Bees.....	15
Discovery of the Old Northwest.....	15
English History Stories.....	15
Hans Brinker .....	15
Irving's Sketch Book.....	15
Captains Courageous .....	15
Story of the Romans.....	14
Greek Stories .....	13
Christmas Carols .....	12
Boys of '76.....	12
In the Boyhood of Lincoln.....	10
A, B, C of Electricity.....	10
Story of Cotton.....	9

The intellectual nourishment in the eighth grade in Denver, in addition to textbooks, consists of an average of 4.5 books per building. Those most frequently found are:

TITLE—	Number of Schools with Sets
Baldwin's Eighth Reader.....	30
Julius Cæsar .....	22
Silas Marner .....	21
Man Without a Country.....	19
Lady of the Lake.....	17
Quest of the Four-leaved Clover.....	17
Merchant of Venice.....	13
Snow Bound .....	11
Vision of Sir Launfal.....	11
Story of the Great Republic.....	10
Trees and Peaks.....	8
Ivanhoe .....	7
Making of Colorado.....	6

Of scattered sets not included in this list, each building averages about one. It will be noticed that there is considerable variety; and also that the majority of buildings are unsupplied in the case of each of the books, except the discarded readers now used for supplementary purposes.

Books commonly used in the eighth grade of the fifty cities are:

	Of the Fifty Cities
Man Without a Country.....	28
Sketch Book .....	23
Uncle Tom's Cabin.....	16
Ivanhoe .....	16
Last of the Mohicans.....	14
Franklin's Autobiography .....	14
Story of the Greeks.....	14
Story of the Romans.....	14
Julius Cæsar .....	13
Enoch Arden .....	13
Dickens' Christmas Stories.....	13
Merchant of Venice.....	13
Building the Nation.....	12
American Inventors and Inventions.....	12
Deerslayer .....	11
Two Years Before the Mast.....	11
Life of Lincoln.....	9
Conspiracy of Pontiac.....	8
La Salle and the Discovery of the Great West.....	8

Notwithstanding the statement in the printed course of study that "the majority of schools have a reasonable equipment of supplementary

readings," it can be affirmed with confidence that there is a great dearth of proper reading materials throughout the city system. Occasional classes have sufficient well-selected materials. This is the rare exception, however, and not the rule.

Much time is given to the reading of "Silas Marner" in the eighth grade in many schools. There is serious question as to whether this is a proper book for grammar grade pupils. It raises the question as to whether those responsible for drawing up the printed course of study in which this book is recommended for use sufficiently defined their purposes for introducing the book, or sufficiently considered the nature of child psychology of the grammar grade age. In case of question, when there are scores of books more suitable for the purpose, it should not be used for class study.

Classes in certain of the buildings are supplied with magazines for a part of the work. Such magazines are provided by teachers, pupils, or occasionally purchased with funds held by the school. Apparently they are not supplied at public expense. The little weekly entitled "Current Events" is subscribed for by the children of very many schools and used in the supplementary reading work. While a few of the teachers properly value current publications and are making excellent use of them, in general they are not valued by the teachers, and they are not used. They more value the world of the past and the world of the abstract. We find here again an unevenness in the work that needs to be looked after by the supervisory staff. The supervisory leaders need to determine the purposes involved in the use of current publications in order properly to supply the needed newspapers and magazines and to supervise both positively and negatively the use of this highly desirable kind of educational material.

One teacher writes: "In my opinion the 'Current Events' has been of the most value to the teacher. They read and discuss the live topics of the day, and are on the lookout for further news from the daily newspapers or current magazines. In this way they improve their power of observation, and at the same time acquire a fund of useful knowledge of the things happening around them."

A careful study of the various purposes of education will reveal the need of a full development of this type of work for the later grades of the elementary school, and certainly through the high school. The doings of the busy human world, as these pass in daily endless review before us, constitute by all odds the most important subject of study for youth and adult. Most other studies are intended merely to contribute to an understanding of this one. The study of the living and the actual should be given in all schools its full and rightful place.

The supplementary reading is used by the teachers in various ways for various purposes. Some teachers use these materials for giving width and depth of understanding at the same time that they are used

for drill in speed, ease and correctness of good reading. Other teachers use them for a narrow and relatively thoughtless kind of sight reading which amounts to little more than a test of the power of the children to recognize words.

The best teachers are making excellent use of their supplementary reading opportunities. The majority of teachers are making moderate use of it. Some are not profiting by it in any appreciable degree. The things that are being done by the best teachers are the things that should be made general throughout the city system. The supervisory staff should find the good work and through forceful leadership bring all teachers to an appreciation of the values and possibilities of the supplementary work; they should see that the necessary material facilities are placed in the hands of the teachers.

Naturally there should be variability in the supplementary reading used in the different buildings. The development of the work to fullness throughout the city system does not mean developing it to uniformity. There should be diversity, because of social differences in different districts.

Certain of the lower grades give half of the recitation time to the supplementary reading; others give one-third; others one-fifth; and a considerable number give none at all. The diversity of practice is very great. Not all of these practices are equally good. Some of them are very poor. The omission of the supplementary work in the lower grades can be explained, perhaps, but it cannot be justified.

In the upper grades the amount of recitation time given to the supplementary reading ranges from 100 per cent to zero. About one-quarter of the classes give a fifth of their time to it. Another quarter give two-fifths. Something less than a quarter give three-fifths. About the same number give one-half. A few classes use no textbook and devote all of their time to the readings classified as supplementary. In a few other classes, none of the upper grade time is given to such reading. Students have only the textbook. Such diversity includes good practice, fair practice and poor practice. The supervisory staff needs to make up its mind what constitutes good practice; then to make this practice general throughout the school system.

In the amount of reading covered one finds all kinds of practice. The accompanying table shows the amount of reading, both textbook and supplementary, that has been covered by a fair sampling of classes in the city system during the first seventy days of the current school year:

**TABLE I**  
**Total number pages covered in certain classes in both textbook and supplementary reading during the first seventy days of current term**

No. of Pages Read	No. Classes Grade II	No. Classes Grade III	No. Classes Grades IV, V, VI	No. Classes Grades VII, VIII
950-1000 .....	...	...	...	...
900- 950 .....	...	...	1	...
850- 900 .....	1	...	...	...
800- 850 .....	2	...	1	...
750- 800 .....	1	...	...	...
700- 750 .....	...	...	...	1
650- 700 .....	1	1	2	...
600- 650 .....	2	2	...	1
550- 600 .....	...	1	1	...
500- 550 .....	2	2	2	...
450- 500 .....	3	4	1	...
400- 450 .....	1	1	5	2
350- 400 .....	1	1	8	3
300- 350 .....	1	2	13	4
250- 300 .....	2	5	8	5
200- 250 .....	...	1	4	6
150- 200 .....	...	3	4	5
100- 150 .....	...	1	1	5
50- 100 .....	...	...	...	4
0- 50 .....	...	...	...	...
Approximate average number pages .....	550	380	360	250

It will be observed that all along the line there are teachers who give a large quantity, and those who give but a small quantity of reading practice. Both cannot be equally good. There are teachers in foreign districts who say that because their children are foreigners and hear little English in their homes, it is necessary for them to do a large amount of easy reading. They therefore read 500, 600 or 800 pages during these seventy days. This is only ten pages a day of reading practice, and for such children certainly is not excessive. If anything, it appears to be insufficient. On the other hand, there are those teachers who say that because they teach children of foreign parentage and because there is little English spoken in the homes, it is necessary to go very slowly through the textbooks, and therefore they will read only 200 pages or so in the seventy days. Their faith is in a different type of work. But schools should not be run too much on faith. There should be knowledge as to whether much practice in reading is the better way to acquire familiarity with English, or whether it is little practice in reading and much in the discussion, pronunciation and study of the meanings of words. Supervisors should know which is the best method of conducting the work—whether a copious amount of practice in reading lessons that are not difficult, or a small amount of intensive study of difficult lessons—and they should see that the effective plan is the one that is used. The Denver building principals are confronted with the responsibility of making careful intensive studies of the situation and furnishing the immediate leadership that will bring about changes in the plan of work in buildings where it is not good.

It is interesting to observe from the table that the second grade classes read more than twice as many pages as the eighth grade classes. The table shows that there is a constant diminution in the amounts of reading practice as one advances up the grades. This is not the thing that one expects. Probably the explanation is that the lower grades are teaching facility in the mechanics of reading, and therefore give a large amount of practice in reading for the sake of speed and of full mastery. As the pupils advance up the grades they are given more and more studies of a literary character that involve a vocabulary intended largely for adult readers and not for children, which also involves forms of thought and sentiments appropriate for adults and not for children. The result is a slowing down of the work for the sake of explaining everything met with in the reading—as though children ought to understand everything that they meet with as they go along. It is clear, however, that the purpose of the reading changes, the appropriateness of the material for the work changes, and consequently the work is slowed down. From any point of view it is unfortunate. Whether the purposes in the minds of the teachers are appreciation of literature, understanding of literature, habits of reading, facility, ease, correctness of reading, understanding of what one has read, or an expansion of one's intellectual horizon—whatever be the purpose, the giving of little practice, the covering of a small amount of material, cannot be commended.

One of the eighth grade classes that failed to cover 100 pages during the seventy days consumed most of the time in the intensive study of "The Courtship of Miles Standish"; a second spent the time on "Evangeline"; a third upon "Julius Cæsar"; and a fourth upon "The Lady of the Lake." The latter class covered during the seventy days only fifty-four pages of the book, and to this was given all of the reading time, both that set apart on the program for the textbook and that for the supplementary. Let the city decide upon what it is after in the reading work, let those teachers and supervisors of widest educational vision now in the system have a voice in the shaping of policies, and such short-sighted procedure will disappear.

One does not have to go outside of the school system to learn what ought to be done. If one will go to the grammar grade teacher who is covering 700 pages, to the one who is covering 600 pages in the given time, or even to the five covering about 400 pages, one can get the necessary suggestions as to what ought to be done. These teachers are informed; their principals are informed. The wisdom that the city has already employed in certain of the buildings should be utilized for bringing the work up to the same standard in all of the buildings. It is a matter of developing an organization that is able to harness up experience and understanding wherever it may be found, and to employ it for



the good of the whole system; and not merely for the good of the classroom or the building where it happens to find itself temporarily.

The lack of reading materials in many of the buildings is not wholly due to a lack of appreciation on the part of teachers. One teacher writes: "Requests have been sent in repeatedly in past years for supplementary readers for my grade, and this is the first year it has been honored."

It is not uncommon for teachers to say that no supplementary reading books have been supplied for their classes. In such case, somebody is neglecting his or her duty. Responsibility for seeing that the *means* of education are to be found at every building should be very definitely placed.

Teachers frequently say that their classes do not cover a large amount of reading because the pupils are too backward for much work. If one searches out the causes of this backwardness, however, in the reading, he will usually discover that it is because they have had restricted opportunities for securing a copious practice in reading in the preceding grades; and partly they are still backward in their reading because they are not at present securing that voluminous amount of practice required for facility, speed and understanding. To accuse the children is to put the blame at the wrong place.

An eighth grade teacher in one of the buildings after finishing three sets of supplementary readers during the first three months of the term says: "More is needed because there is time to read more." More could not be read, however, because there was nothing else available. This reveals a frequent cause for covering a comparatively small amount of ground, and thus giving the pupils a comparatively small amount of reading practice. Both teachers and pupils, therefore, acquire the habit of taking a long time to cover a little ground, a habit of dawdling, a habit of minutely dissecting things that are spoiled by the dissection, and which is often only a waste of time.

The teacher from whom the quotation was taken should be found by the school authorities and given an opportunity to show the other eighth grade teachers how such work can be done.

It is very common in the lower grades for classes to be supplied with only three books of a kind. This is the rule in the first and second grades. The usual method of use needs looking into to see whether it does not involve large waste of time and opportunity. Only two children can be reading at one time. Only two children of the class are securing reading practice; the others are securing *listening* practice. No doubt the latter has a place, but in general pupils all along the line from first grade to the end of the college course secure too large an amount of listening practice as it is. They will get enough or too much of this without consciously trying to introduce it. The thing that each pupil needs is *practice in reading*. They cannot practice in

reading except as they have a book before their eyes. The primary grades need on the one hand to have a number of sets of reading books sufficiently large that each member of the entire class can have a book to read. On the other hand, there ought to be quite a number of small sets or individual volumes that are to be used for individual silent reading only.

One thing greatly needed is a well worked out system of exchange of supplementary reading sets. One set large enough for a class might well be used by nine classes of that grade during the nine short months. This is now accomplished in some degree as buildings borrow sets that have been used in the building where owned. Such a plan at best cannot be very effective. The thing needed is a central store-house of supplementary sets in sufficient number that a set can usually be obtained the week that it is needed and called for; and which is then returned to the store-house as soon as it has been completed.

Instead of having sets owned by individual buildings, they should be the property of the city school district. A set now used in the fifth grade, let us say, in the building where owned, may then stand idle and unused for the other eleven months of the year. This means wasted opportunity. The present willingness to loan the books indicates an appreciation of this fact.

Teachers are often entirely satisfied with the supplementary reading situation if there is a sufficient quantity to take up the full time of their class. They seem not sufficiently to consider the various values of a well-chosen reading course. They do not sufficiently consider aims and purposes as these determine the content of the reading. They are the ones who say: "These books were read because nothing else was available." Of course, it is better to use a poor instrument of teaching than nothing at all, but somebody is at fault in the total organization if a teacher has to use an unsuitable instrument in the work simply because nothing else is available.

In a few buildings supplementary reading work has definitely developed for the purpose of taking care of the brighter pupils in the classes. Teachers give the brighter pupils and the good readers more sets of books to read than the slower pupils. One teacher says: "The brighter pupils can read two or three times as much as the slow ones."

Teachers who have "Evangeline," "Courtship of Miles Standish," "Snowbound," "Lady of the Lake," "Julius Cæsar," "Silas Marner," etc., frequently say: "We have everything that we need for the reading of our pupils." It is clear that such teachers are gripped in the bonds of tradition—the type of tradition that seems to have been in the saddle in drawing up the printed course of study for reading in the grammar grades.

Other teachers with more professional vision and understanding are asking for the following things in addition for their classes: his-

torical readings, geographical readings, biography, stories of invention, stories of great industries, stories of the conquest of the great West, stories of the Rockies, popular science, applied mechanics, natural history stories, inspirational stories about great men, stories of current events, the story of coal, of cotton, of steel, of oil, the story of Colorado, stories of the mining industry, stories of travel, etc., etc. These latter teachers have broken through the bonds of tradition. They are ready to give about all of the information that the city needs for the present as to the materials that should be procured and covered in this work.

No single teacher was met with who seems to have thought through all of the possibilities and needs in this field. One finds partial insights, but the sum of the partial insights make up a full and well-rounded program. A city school organization should be able to utilize the many partial insights in drawing up such a well-rounded program, and for giving teachers the balanced understanding needed for carrying out such a program.

"Supplementary reading should be standard *figure*. The geographical, historical and other purely informative *readers* should not be used as readers." (Course of Study, p. 1)

This rather surprising course of *studies* is one that is more honored in the breach than in the observance. Fortunately for many of the schools it is not being *of such a nature* partly because the requirement is not a valid one, and partly *because of the lack of supplementary sets of standard literature*.

### The School

School libraries are common *in the schools of Denver*. They are not often developed, however, *as instruments of training*. Many of the schools report that *for the few sets of supplementary books supplied for each grade, there is no school library of any kind*. This report that they have but a small school library. Other *that while they have a school library, there is nothing special for the children of their grades to be found in this*. This latter statement is also very frequent.

Since so much of the *readings* needed for present-day conditions must come from wise *library situation* it is indispensable. *efficient education that is demanded by the present and developed along with the children*. Every school *library should be carefully selected for each child*. *of the permanent type which remains* *the fundamental* *buildings* *A portion* *of the fund-* *ation is hot* *more diffi-*

of it will be in the form of the traveling library which circulates and continually brings new books to each building adapted for each of the grades.

Certain of the teachers report that most or all of their pupils are always glad of an opportunity to get at the school library. Other teachers report varying proportions, such as three-quarters, two-thirds, one-half, one-third, one-quarter of the pupils as taking advantage of the school library. Many teachers report that it is little used. Naturally in the very frequent case where there is no library, the use is zero. Certain of the teachers are very enthusiastic about the possibilities of the school library. Almost as large a number report that the pressure of the regular school work is too heavy, and that pupils have little time to take advantage of it.

It seems very clear from the variety of attitudes on the part of teachers and in the different degrees to which the school library is made a part of the training of children, that the possibilities and the uses of the school library have not been carefully studied by the teaching and supervisory staff. It is really an instrument of tremendous power that cannot be lost sight of in any efficiently organized school system.

### Chicago City Public Library

The city public library, so far as the funds at its disposal will permit, has been devising new methods of co-operating with the public schools in the matter of supplying library books to children. The city library at intervals issues printed book lists giving the titles suitable for the different grades in the public schools. In many of the buildings, these are distributed to all of the pupils above the primary grades. Teachers who realize the educational possibilities of this type of educational work employ many methods of encouraging the children to take advantage of the opportunities offered by the public library. They co-operate with the library in distributing membership cards; they encourage pupils to attend the story telling classes at the library once a week; they talk to their pupils about books good for them to read; they read portions of a book to the children; or they tell part of the story of a book and encourage children to go to the library and get the book for finishing the story through individual reading. They send pupils to the public library or the branch libraries for the purpose of getting books to be used in class work and at the same time to familiarize the pupils with the procedure of getting books. They make class assignments which require the pupils to go to the library for references. As they study the short extracts of stories given in the readers, they suggest that pupils read the entire story in the library volume.

It must be said, however, that these methods of encouraging wide

reading by teachers represent the exception and not the rule. Relatively few teachers are doing it systematically. A few teachers frankly express their disbelief in the library work as an important part of the reading training. Observations based upon what is actually being done would indicate that this disbelief or at least lack of positive belief is the usual thing.

Teachers are unanimous, so far as they express themselves, in their praise of the attitude of the public library people. As one teacher phrases it: "The system seems excellent, and the librarians are very gracious and accommodating."

A few grammar grade teachers say: "Every child in my class has a public library card." Others say that a large proportion of the children have cards. The majority say that relatively small use is made of the public libraries by the children of their grades. The inequality in the encouragement of children to use the library on the part of different teachers thus shows itself clearly in the results. The supervisory staff, the natural leaders in starting and in supervising all desirable movements in the schools, should see that the movement is made universal. It should not be left to the initiative of only the specially progressive teachers.

The public library with all of its branches is not at present equipped to give the quantity of service needed by the situation. To illustrate: A teacher of the fifth grade reads or tells a portion of the story contained in a certain book, and recommends that the pupils of that class secure the book and finish the story individually. When the forty children of the class appear at the public library, there are not enough copies to go around. Practically every child must go away empty handed. Two or three experiences of this kind very effectually discourages the child. The experience of usually finding the copy "Out" will prevent the formation of the library habit. Many teachers say: "My pupils experience no difficulties in getting books." This means either that the demand is very small in proportion to the number of pupils found in each grade of the public, private and parochial school systems, or that the teachers have not investigated into the situation. Both appear to be the usual case.

A few teachers say that when a child finds the book "Out" he often takes some substitute. Children are ignorant as to what they ought to get. They cannot judge of the contents of books they have not read. They simply choose attractive covers and pictures and generally get a book that is unsuitable for them. This also is a powerful deterrent to the formation of library habits.

*When a boy or a girl has been brought to the point of wanting a book of a certain type, it ought to be available. In a matter so fundamental as this, schools should be prepared to strike while the iron is hot. When the desire has passed away without satisfaction, it is more diffi-*



cult to arouse it a second time; and in any case it means wasted labor to have to do it a second time when the first time should have sufficed.

One teacher says: "If every room could have a choice selection of books suited to the children of that grade and the children were allowed to use them whenever they had leisure time, and to take them home at night and on holidays, it would not only create a greater love for reading, but aid in the progress of the child." Another teacher suggests that each class room be supplied with a traveling case of fifty books suitable for the grade, the books to be selected by the teacher and the set exchanged for a like number whenever the situation required a change.

These suggestions are excellent. They cannot be too highly commended. The city would do well to examine into what is being done along this line in certain schools in St. Louis.

The school people should select the books to be read. Those who are responsible for the education of the children should be those who are responsible for the means to be employed in this education. While this principle is sufficiently obvious, it must be remembered that trained library people have been systematically studying children's reading tastes and needs more carefully than most teachers and principals. And they also have a greater familiarity with the books available. The two groups should therefore co-operate in the choices, one side furnishing a knowledge of the particular children whose needs are to be met; and the other, the needed knowledge of the books, and of the library experience of other cities.

The books chosen by the children are often highly undesirable. One teacher says: "It is a common thing for mothers of bright pupils who are failing in their school work to tell us that these pupils read five and six books a week from the library." Under such circumstances investigation usually reveals a type of reading indulgence and dissipation that is undesirable from an educational point of view.

It probably is not desirable to have two elaborate systems of library service, one for children and the other for adults. Except for well-selected room libraries of constantly used books kept permanently in each room, it would appear that the public library system is best in position to supply the service. But it needs a far larger number of duplicate copies of those books which children ought to read as a portion of their education. It appears that there ought to be a carefully developed co-operation between school board and library board in the purchase and handling of the books, whereby each takes care of that portion of the labors for which it is best fitted.

### **The Home Library**

"With scarcely an exception the pupils are well provided with reading matter in their own homes." This statement is frequently made by teachers whose pupils come from good homes. There are



homes where proper and sufficient materials are supplied, but even in the best neighborhoods they are the exception. In the majority of cases, in such homes, reading materials are not provided for the child suitable for his different stages of development and for the different purposes for which he should read. It is not enough that there be merely much reading material in the homes. Generally it is designed for adults, and so far as it is bought for the children, it is in too great measure the holiday type of children's books which only too often is of little or no value. The school can no more depend upon the homes in general to provide the right reading material for the children than they can depend upon the homes to teach the reading itself.

## Classroom Methods

The purpose of the work in the primary grades in Denver are very thoroughly understood. Methods, therefore, have been carefully worked out. In general they conform to the best modern practices.

In the upper grades where the range of purposes should become much wider, the method of conducting the reading training ranges from excellent, on the part of a few teachers, to poor, on the part of a few teachers, with the great majority of the teachers scattered between these two extremes. The common vagueness of thought as to the controlling purposes is the chief explanation of the weaknesses observed in the work.

In those classrooms where the teachers value silent reading; where they value reading of a varied character relating to all kinds of serious topics; where they value much reading and rapid reading; where they see that the mechanics of reading is best mastered when children are using the reading as a tool and not as an empty gymnastic; where they do not mix reading for thought, word-study, pronunciation, dictionary work, etc., so as to bring about mere confusion in the thought of the reading; where they are supplied with the proper reading materials in sufficient quantity—in those classrooms where all these things are found, the work is excellent. Unfortunately they are rare. Generally there is too much *teaching* and not enough *reading*.

The gravest fault of methods observed in connection with the reading work of Denver is that it too often is not work in reading at all, but in language analysis, literary analysis, word study, etc., or it is a combination of reading with these things. Now these various matters are all desirable, and it is commendable for a city system to take care of them all; but they must not be used as substitutes for practice in reading, nor must they be mixed with practice in reading in such a way as to destroy the efficacy of the reading. The faults indicated are very common, though not universal. One teacher says, for example: "When we take up a story for reading, the whole is read uninterruptedly. All

comment or discussion is forbidden during the reading. A single question often diverts thought from the story." This teacher has clarified her ideas and is ready to lead the thinking and practice of the rest.

Spoiling the reading by this mixing of the elements is so common, so mischievous, and so expensive that we are justified in stopping to state a technical principle. First let us mention the fact that reading experience is not for the purpose of entering into the immediate experience of the present moment. It is for imaginatively entering into the remote experience of others as the printed page reconstructs that experience in imagination. Now this experience of others was at the time continuous in its series of events and with a particular environment that belonged with that series of events. Reading conditions must help the reader to reconstruct in his imagination that same series of experiences in the same order with the same freedom from interruption by foreign elements, and within that same environment. The nearer the reading can recreate within the reader that experience of the other and the more completely the reader can lose himself to his present environment, the more perfect is the reading experience. The conditions of the reading must not make the reader conscious of the Here and Now. He must not be made to vibrate back and forth between classroom environment and the story environment. While re-living the story he should be as unconscious of the people about him and of classroom conditions as possible. It does not matter whether every word is pronounced correctly or not, nor does it matter whether every word is understood. It is not a time to stop and explain historical, or geographical, or mythological allusions or figures of speech. Naturally there must not be so many of these as to prevent the reader's moving forward securely with the full current of the story. But where a story is adapted to a person's maturity and understanding, he is able to pass over a great many of these non-understood things without experiencing any difficulty with the story. If he cannot get the story without stopping to have the various things explained as he goes along, then clearly that story is not adapted for his reading, and all the explanation that a teacher can give does not help the student really to read it, in the sense mentioned. The explanatory route will not enable one to enter into the general current of the story at that time. It may be word-study, or dictionary work, or study of figures of speech and of allusions. It is not reading, however, and it cannot be reading under such circumstances. And further, in all probability it will be a rather poor quality of word-study, dictionary work, etc.

We must recommend that the city system carefully distinguish training in reading from training in word-study, pronunciation, dictionary work, literary analysis, etc., and that appropriate methods be developed for each of them. This needs to be done so that when teachers are doing one of them they will be doing that one, and when they are

doing the other they will be doing the other; but not doing the one with the thought that they are doing the other, and not mixing the two so as to destroy efficacy of work in both.

It is very common for the pupils to "correct" the reading mistakes of the reader, just at the close of the paragraph that he is reading. It is not uncommon, in fact, for him to be interrupted in the midst of his reading and every mispronounced word corrected as he mispronounces it. The result of the method is to break up the reading into fragments, to cause the attention to vibrate back and forth from the thought of the reading to the thought of the language, and to prevent either reader or listeners from actually entering into the spirit of the reading.

Now as a matter of fact, a reader should be conscious of the fact that the listeners will have their attention disturbed by mispronunciation or by halting at difficult words, and also it is well for one to have his mistakes pointed out so that he can be on the watch for them and not make them a second time. These ends are to be secured, however, without interrupting the current of the story. They are also to be secured in such a way as to make them educationally effective. At present it is a very ineffective method of correcting a pupil's mistakes permanently by pointing them out in this casual and superficial manner. Generally the reader feels that in the criticism of his mates he has received his punishment, and so dismisses the thing instantly from his mind—and the next time makes the same mistake. The method not only destroys the reading as such, but it fails to accomplish the wholly desirable result at which it aims.

One teacher says: "During the course of the reading I make remarks myself for several reasons: (1) Children need to hear older people talk, for the sake of the models of good English; (2) pupils cannot see all of the fine literary points for themselves."

Both of these statements are true, but they do not justify destroying the reading experience in order that they may be accomplished. However valuable such remarks may appear to the speaker at the time, they are often very inconsequential, pointless and miscellaneous. Children ought to hear older people talk, but it should be upon appropriate occasion, and not as a continual interruption of a valuable exercise. As to the other purposes of remarks interrupting the reading, it must be said that fine literary points are highly intangible and difficult to explain. A good deal of the comment intended to serve this purpose is but vagueness; or it is a very watery and a very useless kind of sentimentality. In general the beauties of a literary selection need no more explanation than the humor of a humorous selection, if it is adapted to the degree of maturity of the pupils. And if they are permitted to enter into the story freely and uninterruptedly, they will appreciate the beauties infinitely more through this first-hand experi-

ence than they can possibly do through second-hand explanatory experience.

One teacher said: "I take note on paper of any mispronounced or misunderstood word. At a later time then I have five minute drills on them again and again. The list grows in one way, but diminishes in another." This teacher has learned how to catch the mispronounced and misunderstood words and how to correct them without interrupting the reader. She has learned a method of correcting them that does not mean the casual correction which is forgotten immediately. She drills them in until they are driven home.

This teacher should be found and her wisdom utilized for developing a system of correction of English that is effective for its own ends, and which does not destroy the efficiency of the reading by mixing things that ought not to be mixed.

One grammar grade teacher described her plan in the following words: "The reading lesson is taken up directly in class without assignment or preparation. The teacher reads one sentence at a time and questions pupils. Dictionaries are used in class, and correct meanings of difficult words are worked out. The teacher reads paragraph after each sentence has been gone over. Questions are asked pupils to lead them to see the meaning. Usually the selection is read by pupils after it has been finished in a recitation and a study period combined." This is not reading. A selection that requires that type of treatment is wholly unsuitable for the reading of a class. It is unsuitable for word-study. This undesirable method is not uncommon in Denver.

In reading a story made up of a number of paragraphs, it is a very common practice in Denver for teachers to stop the pupil who is reading in the very middle of a paragraph, the next pupil going on from that point. Where the reading is continuous without interruption or comment, the device is not particularly harmful to the continuity of the thought, and may have some value at least for the portion of the class that have not already read in keeping them attentive so that they will know where to begin if called upon. But such continuous reading is decidedly not the rule. There is usually intervening discussion of one kind or another. The discussion will cover part of each of two paragraphs. Since a paragraph is expected to present a single and more or less organic thought-whole, the breaks are unnaturally placed and destructive of all continuity of thought. Pupils' attention should be secured through the use of less harmful devices. Everything should be done to preserve thought-wholes and general thought-continuity.

## III

## VOCABULARY

The schools of Denver, in common with those of most cities, give much expensive time to *explaining the meanings of words*. This is usually accompanied by dictionary work, using the words in sentences, making of new-word lists, spelling and language lessons involving the new words, etc. This study of the meanings of words usually comes in connection with the reading and spelling, but it is often involved in the study of history, geography, current events, hygiene, language, etc.

There can be no question of the legitimacy of the purpose. Each child should possess, at the end of school life, a large reading vocabulary, and a sufficient speaking and writing vocabulary. Any educational exercise that will effectively and economically promote vocabulary extension is desirable and legitimate.

There are, however, different methods of doing the work, some of which are good and some of which are quite the reverse. Both kinds are found in Denver, and the better methods are the less common. They have been less consciously and less completely developed. The undesirable methods are unfortunately common. They are more conscious, and have therefore been more completely and more systematically developed.

Let us note first a wasteful and inefficient method that is very common in the schools of Denver. It is well stated in the words of one of the teachers: "I have conscientiously tried to increase the pupils' vocabularies by giving and asking for good definitions of all new words, especially those found in spelling and reading. We have also used the words in original sentences in order to be the better able to understand their meanings." Teachers frequently require the definitions of a certain number of words to be looked up each day in the dictionary, the meanings learned, and the words used in sentences. Occasionally, this list is fairly long, though usually short.

The method is very frequently employed in ways that spoil the reading lesson. There is continual interruption by the teacher to inquire as to the meanings of words. If the children cannot give them offhand, they are sent to their dictionaries, or at least one of the pupils is sent to the dictionary. While he looks up the word, the class continues with the lesson for a minute or two. The lesson is then interrupted for his report. Often out of two or three meanings given in the dictionary he gets the wrong one, so that after his report they have to go back to discuss the situation and in that way find the right meaning of the word. Continued throughout the difficult reading les-



son, the result is that the time is mostly spent, not in reading, but in a relatively profitless examination of words. In too large a degree, sometimes almost completely, the pupils have been prevented from really reading the selection. They have not been permitted to enter appreciatively into the continuity of the *thought*, which alone constitutes reading. For this reason, even when the dictionary meanings are brought forward, they have little or no significance. The thought of a selection has to be fully appreciated before one will really feel the gap in the thought produced by an unfamiliar word. If one has not read the selection with understanding, then he will not feel this gap; he will not feel the need of the new word; he cannot appreciate its meaning; the time has been wasted; the whole exercise is mere futility. One Denver teacher who does this, and fails, and is intelligent enough to know that she is failing for some reason, says: "The pupils pass so quickly from one new word to another new word that they seem not to remember any of them." It is not really because they pass so quickly and meet so many new words; it is because the method is not one that can possibly succeed in developing an understanding of meanings.

The case is even worse when the plan is used in connection with the spelling, by having pupils get the dictionary meaning of words and then use them in artificial sentences—sentences that are not speech; that are not called into being for the sake of saying something, but only for the gymnastic exercise of a word. Now, really, there is no need for one to learn to spell words of which he does not already know the meaning. One will need to spell only words that he will use in his writing, and he will use no words in his writing of which he does not know the meaning. Oral use of words precedes the written use of them. Spelling lists should be made up of only words already in the pupil's active vocabulary. A spelling exercise should not, therefore, be a vocabulary exercise. The latter should have been accomplished long before.

When a word in the spelling list is actually unfamiliar, the exercise is an attempt to pour a meaning into an isolated word, standing out of context. In such case it is not a part of speech, nor is it in direct association with the reality to which it refers. It happens that words are not learned that way. It may appear to be a simpler, more direct method than the long-route process indicated and recommended in later paragraphs. But unfortunately for the method, the human mind does not work that way. Any effective mode of procedure must take full account of the mind's natural method of mastering language.

How are the meanings of words to be mastered, and the vocabulary thus extended? A general formula can be given. *Pupils must come into experiential contact with the realities to which words refer, and at the same time with the words that are necessary for thinking those realities.* Word-content and word-form are thus built into the mind



together in a single process. The word is felt to be an organic part of the thing; the latter is not felt to be complete except as the word is there to express it.

Well-informed Denver teachers recognize the validity of this formula and are employing various good methods that it demands. One teacher said: "We read many good books during school time, and I encourage the pupils to do as much outside reading as they can. Children who make free use of the library are much more fluent, both in subject matter and in words. We need an abundance of short, well-written stories *on every possible subject*." A second teacher mentioned the use of systematic talks to the children, telling them stories or presenting facts upon topics in history, geography, current events, etc., in which she uses language that is "just a little above the pupils," in the expression of ideas that are on the pupils' level. A third teacher mentions observation of store windows, trips, excursions, pictures, and other activities which bring children into contact with realities. Growing out of these various kinds of experience, the teachers have oral and written reports, reproductions, compositions, discussion, etc.

By these various methods pupils are brought experientially in one way or another into contact with realities, while the language is being used in direct association with those realities. Meaning and form come together. As the mind is saturated with ideas, it is saturated with the words necessary for managing the ideas. If asked to do so, pupils may not be able to define the words. Definition, in fact, requires a definite logical technique, of which the pupils have little need. That they get the thought that is borne by the words is all that is needed. When they come to their oral or written expression of the thought, they tend inevitably to use the right words because they are felt to be parts of the things of which they speak. If their reading has been upon a great variety of topics, the reproduction or discussion will necessarily involve vocabularies appropriate to this great variety of topics. Words hitherto new and unused will be used with perfect naturalness because of the pupil's attention being focused upon the meanings and not upon the words. Teachers who use this plan frequently mention the value of "Current Events," "Popular Mechanics," and other readings dealing with a variety of things in the active world about us.

The teachers in Denver of this mode of thinking—unfortunately they seem to be in the minority—are upon the right track. They have learned that a child's natural mode of learning language is by hearing language that is a little beyond him, but not too much beyond him; by reading language that is beyond him, but not too much beyond him; and then by expressing the thoughts that he has mastered, which involves the relatively unconscious imitation of at least a portion of the words that hitherto were beyond him. As one teacher phrased it: "Most of

my pupils come from homes where little or no English is spoken, and I find that the vocabularies and understanding of English are best increased by stories that are not too difficult, nor too long, and which are very interesting."

Generally the thought of a selection can be got without dictionary work. So far as this is possible there is no excuse for the use of a dictionary. It is possible in any selection to pick out dozens of words which children cannot define. This does not mean that they do not get the meaning of the selection as they read it. Let them look up all of those words in the dictionary that they could not define; only occasionally will it help them to get the thought of the selection any more fully than they got it without the dictionary work. And what is more, it is always an interruption; it takes time; it is a disagreeable kind of work. Where good methods are used, it will only occasionally be necessary.

To prevent misunderstanding, we must here point out the rightful place of dictionary work. When the meaning of a selection that is adapted to the pupil's level is obstructed by the felt lack of understanding of some particular word—when the selection cannot be read with *sufficient* understanding for the purposes in hand—then it is necessary to go to the dictionary for clearing up that particular word. Generally, however, a selection can be read with sufficient understanding without a full understanding of the meaning of every word met with. Children should be permitted to pass over many words which they do not understand, provided they are able to get the general current of the thought in sufficient measure for the purposes in hand. Such words met with the first time may carry little or no meaning in themselves. Met with again and again gradually an understanding of the meaning of the words grows up within the mind of the reader. This is the natural way of learning the meaning of most words. Occasionally, however, a word often met with does not in this way gradually reveal its meaning. For such words one must in time have recourse to the dictionary. When reading is of the type recommended in the chapter dealing with that subject, words will be met with so frequently that the meaning will almost always reveal itself without the dictionary.

Teachers who use this effective method of developing the vocabulary frequently complain that they have not the needed reading materials. They have an insufficient quantity or it is unsuitable in quality. They ask in this connection for history stories, nature stories, travels, classic stories, interesting short stories. They speak of the need of development of school libraries and extension of the juvenile portion of the city branch library, the development of home libraries, etc.

In the composition work, especially the oral work, teachers very frequently say that they meet a very great obstacle to enlarging the

active vocabulary of children in an almost universal self-consciousness when children attempt to use new words. As one of the teachers phrases it: "Children, as a rule, avoid the use of new words, even when they know them, and seem shy of using 'big' words for fear of ridicule by classmates." Another teacher says that boys especially seem to fear the use of new words. In discussing the matter with the boys, they say that if they do not use the slang and mispronunciations of the playground they will be laughed at by their comrades. Consequently they cling to a meager and undesirable vocabulary.

As a matter of fact this frequently mentioned difficulty is largely due to the use of conscious and therefore artificial methods. Ask a boy to explain to his classmates, under conditions that are natural, the workings of an automobile which he sometimes drives, he will use "big" words like carburetor, magneto, cylinders, pistons, battery, generator, pneumatic, commutator, transmission, differential, etc., etc. A boy who can make such a report has come into contact with realities. The words are so much a part of these objective realities, that he is no more self-conscious in thinking the words than in thinking the meanings. If he is really explaining the automobile to people who want to know about it, and if he is really interested in making them know it, he will not stumble on the words, nor will he be self-conscious in the use of them.

Let a boy make and then afterwards describe to his classmates any one of the scores of things currently described in "Popular Mechanics," or some similar journal, and he will use the terminology of the thing in a perfectly natural way, and thus widen his vocabulary and his knowledge of the meaning of words. Let him read well-written books of applied science bearing upon electricity, photography, gasoline engines, gold mining, cattle raising, bee culture, sugar-beet manufacture, mountain formation, road building, water supply of cities, irrigation, etc. Each field of reading will widen thought, widen ideas, and thereby give the necessary new words for carrying the ideas. Let him read of life in other lands involving the things used in that life—life in Alaska, in Mexico, in Egypt, in India, in Japan, in Greenland, in the Philippines, etc., let him read historical stories, dealing with peoples who have lived in different parts of the world and in different ages of the world—if he really enters into these matters with interest, and if when he talks, it is for the purpose of saying something to his classmates and not for the mere artificial gymnastic of "reciting," then self-consciousness will not rise as a bar to prevent the expression of his ideas and therefore practice in the use of the wider vocabulary.

Another teacher said: "We need more talking by the pupils on definite subjects. We do not have enough of this. We do not seem to have the time for it." This appears to express the partial realization that is probably very common in the teachers. They realize the value

of the plan mentioned, and then use the undesirable ones referred to because they seem more direct and more economical in the use of time. There can be no economy, however, in using methods that do not work. They need to see that they do not require separate time for the method here mentioned. It should be taken care of as a part of all training that deals with the content-studies.

Teachers frequently complain of the lack of interest on the part of pupils in using words that are met with only within the classroom. It is not so much a lack of interest in the words as it is a lack of interest in the thought content of so much of the classroom work. The remedy is a vitalization of the thought of the classroom. The language will then take care of itself.

"The way to develop vocabulary is to develop a habit of accuracy of statement," said another Denver teacher. No truer words could be spoken. Let a boy familiar with the workings of an automobile explain it with a conscious attempt to make his meaning perfectly clear and accurate, and no better language exercise can be imagined. He will not drop into slang; he will not try to use the boy's language of the playground. He will not fear to be laughed at by his mates.

One teacher mentions her belief that "the greatest difficulty is in the pupil's lack of confidence in his ability to use the words of which he has learned the meanings." This is the fruit of the dictionary method of getting mere hazy ideas as to words. The remedy is to place things first, and let words be only a concomitant. When a boy has something to say which he thoroughly understands, but the meaning of which involves a complicated vocabulary, if he has the meaning clearly in mind he will not often show lack of confidence in the words to be used. He will tend to use them with facility, with accuracy, and with confidence. As another teacher phrases it: "Some children are not inclined to use the words freely at first, but in story telling they unconsciously overcome this in their desire to express themselves clearly to their listeners."

A certain amount of work is done in word-study, word-compounding, prefixes, suffixes, synonyms, antonyms, etc. This is a type of work greatly to be commended when rightly organized. It should relate chiefly to words that have already become familiar—quite familiar—in ways mentioned. When this foundation has been well laid, a great deal can be done in a comparatively short time. The not infrequent attempt to enter into some discussion of the history of English words in the grades is commendable. Unfortunately, however, teachers seem not to be supplied with suitable helps. Good presentation of this topic needs to be fairly full, so as to involve a good deal of reading. But this reading should be concrete, easy and interesting, and therefore covered rapidly. Difficult, abstract, didactic readings or exposition by the teacher is unsuitable for the work of the grades.

## IV

### SPELLING

Taking the city as a whole, about an average amount of time as compared with cities in general is given to the teaching of spelling. The amount of time devoted to the subject in different buildings, however, or even in adjacent classes in the same building is exceedingly diverse. It ranges in the grades beyond the second in different schools and classes from zero, on the one hand, to 150 minutes per week upon the other. The following table indicates the diversity of practice:

**TABLE II**  
**Time Per Week Devoted to Spelling**

	4-B	4-A	5-B	5-A	6-B	6-A	7-B	7-A	8-B	8-A
Alcott .....	50	50	40	40	20	40	50	40	100	100
Ashland .....	40	50	60	75	60	50	50	40	100	30
Bryant .....	125	55	50	45	80	40	65	65	35	90
Cheltenham .....	50	60	50	50	100	30	60	80	60	60
Columbian .....	55	60	100	75	75	75	100	25	50	75
Elmwood .....	90	45	80	95	90	75	40	80	100	60
Franklin .....	50	50	50	50	50	50	40	40	40	40
Lincoln .....	50	30	100	115	70	30	40	60	50	100
McKinley .....	60	75	40	10	35	35	60	70	0	0
Whittier .....	130	150	40	125	75	80	80	50	80	100

Only a few sample schools are given. The table, however, is sufficient to show certain types of diversity that may or may not be justified, according to conditions. It shows the kinds of things that need to be looked into. For example, why should the Alcott, the Lincoln and the Whittier schools devote a full hundred minutes per week of the teacher's time to spelling in connection with the 8-A grade, when the Cheltenham and Elmwood find sixty minutes sufficient, the Franklin forty minutes, the Ashland thirty minutes and the McKinley none at all? At the Whittier, if 150 minutes is necessary for the 4-A grade, and 125 minutes for the 5-A grade, why should forty minutes be sufficient for the 5-B grade which lies just between them? Why should conditions make an even distribution of time desirable at the Franklin, and a very uneven distribution of time desirable at the Lincoln?

Such questions can often be answered entirely satisfactorily. There are often reasons within the work itself why it should be heavily emphasized at one time, and very lightly at a different time. Often there are other conditions within the building which make such adjustments necessary. There ought, however, to be a sufficient reason for the apparently excessive time given to the subject in certain classes before such practice should be permitted to continue. On the other



hand, if the average amount of time given to the subject is actually necessary, there ought to be a sufficient reason for devoting a deficient amount of time to the subject before this practice is permitted to continue. It is probable that the diversity within the city system is due as much to erroneous interpretation of needs as it is due to the necessities of the situation. It is a type of problem that arises in connection with every subject in the curriculum. Each subject, therefore, presents problems of such number and such complexity that the survey could not possibly examine into them in connection with the different buildings. It is a type of problem which demands the presence within the system of a sufficient number of assistant superintendents as will permit a proper examination of the conditions in relation to this diversity.

### **The Course of Study**

The printed manual suggests that spelling be taught throughout the elementary grades. It lays out the work in satisfactory and sufficient fashion for the first two primary grades. Beyond the second grade, however, it does not go. It simply states two or three principles of method and then adds: "A speller founded upon such principles, should be used as the basis in the work beyond the second grade. Teachers should supplement words given in the spelling text by additional words suggested by other work. A few of the rules of spelling should be applied."

This type of assignment gives principals and teachers entire freedom as to the work that they will do. One finds, therefore, great diversity in the matter of the work covered. This diversity shows itself not only in the time allowance to which we have already referred, but also in the texts used, in the number of words covered during the year, in the size of the lesson assigned, in the sources from which the words are taken, in the particular choices of words, etc. The various plans differ greatly in their effectiveness.

### **The Words Taught**

A large portion of the work is done without any use of spelling textbooks. Throughout the system one finds the pupils studying lists of words taken from the geography, the history, the arithmetic, hygiene, grammar, nature study, reading, memory lessons and even music and domestic science. Other word lists are made up from the misspelled words in the pupils' compositions and other written work. Word lists also are used which have been compiled by the various investigators in this field, on the basis usually of co-operative studies or surveys, such as those by Ayres, Jones, Crabtree, the Tacoma spelling survey, the Cleveland compilation, the "hundred spelling demons," etc.

Many teachers use a textbook for a portion of the work. A few



teachers base their work wholly upon the text. At least a dozen different texts are used by different teachers. Except for two or three texts that are often in the hands of the pupils, most of these are in the hands of the teacher only, and word-lists taken from them are given out on the blackboard.

Many word-lists selected by teachers were examined, and in the great majority of instances the type of words chosen can be commended. The words usually are those that pupils are using in connection with some portion of their school work, and are therefore in practically all cases intelligible to the pupils. They become at least a portion of the pupils' reading vocabulary before they are employed for spelling study. The chief exceptions were certain words taken from the spelling text. These were not in any context. Often they were not being met with as a portion of the pupil's active reading or recitation vocabulary, and were therefore often less appropriate for the work. Certain of the teachers complained because they had been unable after several attempts to secure spelling textbooks for their pupils. Observation in the city, however, seemed to indicate that where the teachers were not using the text the work was of a better character than where the text was used. It usually possessed more vitality, and the words were more significant to the pupils.

In the number of words covered during the first seventy days of the past year the diversity was very great. In the later grades there were a few teachers who covered about 120 words. A large proportion of the teachers covered from 300 to 600 words. In a few cases more than 800 words were covered. In the third and fourth grades the number of words used in these spelling lists ranged in different classes from 200 to more than a thousand.

In the judgment of the writer there is justification for the careful study of a relatively short list of words and another justification for the rapid study and spelling of a different long list of words during the same term. Both groups of teachers—those covering a short list and those covering a long list—can present sound reasons in favor of their different practices. And both are probably right, but neither is using a complete method. Previous to the grammar grades it seems clear that both types of lists should be used. They certainly should continue also through the grammar grades as a portion of the work, but giving way upon this level in chief measure to other types of training.

Of the various methods of providing the long lists for the extensive spelling practice, we wish particularly to commend the use of special vocabularies for the purpose, as used by quite a number of the teachers. One teacher, for example, had a list of commercial terms, another list of musical terms and other lists in such fields as the following: Arithmetical terms, grammatical terms, garden plants, wild flowers, birds, domestic animals, wild animals, minerals, terms relating

to Eskimo life, household furniture, clothing, food, building materials, geographical land forms, geographical water forms, climatic forms, military terms, agricultural implements, etc., etc. A list of words grouped in this fashion and well built out calls up an entire apperceptions-mass relating to some important field. While the words are neither an outline nor a summary, yet they call up the thought of the entire field in much the same way. The lists can be used as a discussion lesson as well as a spelling lesson. In another place we have condemned rather emphatically a customary method of "using words in sentences" by way of giving them exercise and of showing an understanding of their meaning. If, however, the words constitute the special vocabulary of a particular field, the discussion of the field along with the spelling permits a meaningful use of words in sentences of a type wholly impossible in the usual miscellaneous list of words drawn from all the ends of the earth, each representing a different field. The single word cannot call up the apperceptions-mass and therefore the attempt to galvanize it into life is usually not very effective. The method here referred to, however, permits an effective use of this exercise.

## Methods

The methods employed in the spelling work must differ according to the results that are being sought. The intensive work using a very few new words each day, and frequently reviewing them on succeeding days, has for its purpose the teaching of words that are frequently misspelled. It is inappropriate for the teaching of any other type of words. On the other hand, the use of the long lists of words is for the purpose of developing a consciousness of the letter-content of words which are sufficiently phonetic as rarely to be misspelled after one's phonetic sense is fully developed, and it is also for the purpose of developing this accurate phonetic appreciation. The long lists will therefore neither be studied nor reviewed in the same way as the short lists.

In the course of study one reads: "Correct spelling is best accomplished by an intensive study of a few words. Children differ in the manner in which they learn to spell, consequently words should be presented to them through every possible avenue. These are eye, ear, voice and muscular sense." The advice here given is thoroughly sound—as it relates to the teaching of the specially difficult words. And Denver teachers are to be congratulated upon the variety of devices that they have been able to discover or invent by way of appealing to the children in a large variety of ways. In this connection we wish specially to commend, however, not so much the various sensory devices employed, but rather those methods which point out to the pupils the "hard spots" in the words upon which their attention needs to be care-

fully focused. Certain teachers, for example, spend more time in discussion and in recitation by the pupils concerning these hard spots that are to be watched than they do in the mechanical matter of drilling the words into the pupils through sensory methods of seeing, hearing, and writing the words. These few teachers are intellectualizing the difficulties. This is the most important thing in the teaching. It is not specifically referred to in the manual. The practice should be systematically developed and made universal through the city.

In the intensive study of difficult words the most frequent mistake observed in the work of the city was the not uncommon practice of giving words from lists that had not grown out of the pupils' work and the meanings of which were unfamiliar to them. For example, in a certain spelling class observed, the first word on the list was "intrigue." The boy spelled it incorrectly. After it had been referred to several other members of the class and spelled correctly several times, the first boy was called upon again to spell it. He then spelled it correctly. The teacher then asked him the meaning of the word. He had no idea. He was sent to his dictionary to find out, and the class waited until he found the definition. This he read to the class, but it was understood neither by the boy nor by the class. The teacher then asked if any pupil in the room had ever heard the word. None could remember ever having heard the word before except one boy who was a great reader and who said that he had met with it recently while reading a story of Alexander the Great.

This is a type of teaching of which teachers must beware as they select words from spelling books and from investigations in other cities, from lists of spelling demons, etc. It can be said with positiveness that the intensive study of no word can be justifiable until after that word has become a portion of one's active vocabulary—at least the reading vocabulary, even if not that of speech or writing. For this reason, methods of work are likely to be better in those classes where the words are drawn from the current work of the pupils rather than from lists obtained from outside the classroom work. The school authorities have done well not to force a spelling textbook upon the schools.

After all is said, however, concerning the methods employed in the formal spelling class, it still remains that this is only the preliminary training for correct spelling and that the culmination of the training comes as pupils make application of their knowledge to their written work. Under normal conditions one spells only when he writes. The main thing needed by the pupil as he performs his written exercises is the habit of watchfulness over every word that he sets down on his paper, and the confidence before he sets it down, or at least before he leaves it, that he has it right. Along with this, of course, is the habit of going to the dictionary or to his word list whenever he has any doubt as to the spelling of a word. Teachers everywhere through the system

look upon the written work as the application of the spelling. Sometimes they consciously use it as a portion of the training in spelling. More often, however, it is not so used. Children are expected to spell their words correctly. They must often correct misspelled words. Sometimes they are given a lower mark where words are misspelled. These are all elements of a method of using the written work as spelling training. But, in general, one does not find a developed consciousness of the specific ends that should be definitely aimed at in using the written work for the spelling training. Teachers in general are obsessed with the idea that the only end of training in spelling is the knowledge of how to spell certain specific words correctly. They do not properly conceive, and do not sufficiently value, the development of a *habit of careful watchfulness* as a major end of the training. Therefore, while they use the written work in some small or even considerable degree, they have not consciously worked out a technique for carrying it on. They keep lists of words misspelled by the pupils in their papers, and drill upon these in the intensive study. This is commendable, and should be continued, and even further developed. But it must be noted that its end is not a habit of watchfulness so much as it is a knowledge of how to spell specific words. It has not the aim to which we are here referring. Even where teachers are bringing pressure to bear upon the children by way of stimulating them to spell their words correctly in their written work, they seem usually not to have developed any clear and full conception of the use of the exercise as a means of developing a specific and valuable habit. There is some consciousness of this, of course, but it has not been developed and the necessary methods have not been sufficiently elaborated.

The thing to be aimed at was clearly stated by one of the Denver teachers: "I tell them to be sure of the word before they write it; when they are sure they have it correct, then they are to write it." The thing to be aimed at is a conscious attitude of mind toward the whole matter. This is really more important than the knowledge of the spelling of specific words. Give them this attitude of mind, and they will become and remain good spellers, in so far as they actually need skill in this art. Without this habit and this attitude of mind, even if taught the spelling of specific words in current drill lessons they do not necessarily remain good spellers. "It has been my experience," said one of the teachers, "that numbers of children standing well in the formal spelling lessons present written work which is very poor indeed in the matter of the spelling." If the formal spelling does not take effect in the written work of the pupils which is being done at the same time, there can be no guarantee that it will take effect in later years after the formal drill has been forgotten. As a matter of fact, the class teaching of spelling should be definitely looked upon as only preliminary, laying a foundation for the more important task of developing

the habits of looking intimately into the words one writes, and a habit of being confident of the correctness before things are written. We are perhaps justified in stopping to mention two elements in the method to be employed:

1. Teachers must bring pressure to bear upon pupils by way of stimulating them to watchfulness. Some teachers now give two marks on the written work, one for content and a second for spelling. Other teachers give a lower mark upon the paper as a whole if the spelling is noticeably poor. Teachers sometimes have papers rewritten where spelling is defective. On the other hand, by way of positive stimulus, teachers sometimes place on display before the school the papers that are perfect in their spelling; pupils receive gold stars on the chart that is kept for the purpose of recording excellence, or they are accorded special privileges for the time which they have gained in not having to rewrite their papers, while the rest of the class are engaged at the laborious task of rewriting. About all of the desirable elements of stimulation can now be found in the work of the teachers of the city. The problem is a matter of making it conscious and purposive, of intensifying it sufficiently to make it effective, and of making it universal throughout the city.

2. Devise exercises which require for their performance the careful scrutiny of the letter-content of the words. We refer to such an exercise as proof-reading. A poor speller with good native aptitude who becomes a proof-reader will soon become a good speller simply as a result of the habit of watchfulness necessary in the performance of his work, and the habit of reference to dictionary in case of doubt. While this would be excellent spelling exercise, it is not very practicable because of the inaccessibility of the materials. But there is in the schools an analagous exercise which has to be performed and which is usually performed at great and useless expense by the teacher. We refer to the reading of the pupils' papers by way of making the corrections required in carrying out the stimulatory policies above referred to. The papers must be read. The pupils need very greatly the drill in the scrutiny of the spelling of the words of those papers, and the habit that will come from such scrutiny. The pupils need that very exercise for their training. The teachers do not need it at all. The reading of the papers and the marking of misspelled words should therefore be given into the hands of the pupils as a definite exercise, having as its end a definite educational purpose. It is not to be used as a means of the pupils helping the teacher, it is to be a means of developing a habit that they need to have developed. In one instance in the city the plan was found in use, but each pupil was marking his own paper solely. It would be decidedly better to have the class divided up into a number of committees, each committee examining the papers written by the members of a different committee. The committee plan



gives the work a degree of impersonality. The committees can be rather evenly balanced in ability by putting upon them both good and poor students. This permits the introduction of the element of competition, a form of stimulation of a very effective character. Each committee is thus a stimulation to each other committee. The best members on a committee become examples to and a source of stimulation to the weaker members of the committee because these weaker members must be brought to be successful in order that the group as a whole may be successful. Stimulation by one's mates is always better when it can be secured than stimulation by the teacher. And the strong are brought to help the weak, and thereby most effectively to help themselves.

We are referring here to having papers gone over for the sole purpose of detecting spelling errors. We shall refer back again to this plan as we discuss the correction of grammatical errors. It is possible to have the same papers read a second time, committee fashion, for the purpose of scrutinizing the grammatical structure of the sentences. It is just as possible, just as valuable, though somewhat more difficult, to have also student scrutiny of the kinds of mistakes made in the handwriting—slant, alignments, quality of line, forms of particular letters, heights of letters, evenness, etc.

Another type of exercise valuable for this purpose is *copying*. This is, of course, now common in the primary grades. It can be made a valuable exercise for the later grades in cases where relatively brief summaries of topics studied can be made to include a large part of the vocabulary of that topic. In the act of copying such materials, children must look intimately into the letter structure of all of the relatively unfamiliar words. If this exercise is supplemented by the one referred to above, and the papers are carefully read by the student committees, the copying work can be made an effective exercise in the development of the type of habit that is desired.

## Teaching the Rules of Spelling

In this, as in everything, there is great diversity of practice. A few teachers give fairly large purposive attention to the teaching of the rules of spelling. The majority of teachers give some incidental attention, but usually not a great deal. A few teachers give no attention whatever to the rules.

These practices cannot all be equally good. If the rules are valuable in some schools, they certainly are valuable for all schools. It seems probable that a moderate amount of training in the matter of the rules is desirable, and that both extremes of practice in the city are undesirable. There should be no such great diversity. As the difficult words are taken up for intensive study, it ought to be possible to develop within the pupils a consciousness of a few simple governing rules. The right spelling of the words in the concrete should be pretty



fully understood, however, before there is any conscious generalization of the rule. When the rule is derived it should usually be inductive, perhaps, and seen by the children not in an abstract statement, but seen within the lists of words themselves to which it applies, and read by the children out of the list of words. It should not be a thing learned in the abstract and then applied by way of giving it concrete significance. The plan here mentioned is really the one that is commonest within the city. It needs to be made universal.

## V

**PRONUNCIATION**

When asked concerning the degree of attention given to pronunciation, one intermediate grade teacher remarked: "We seem to drill almost continuously on correct pronunciation." While the statement is extreme, observation indicates that a large amount of time and energy is devoted to the matter of the pronunciation of words.

The teachers are not over-emphasizing the importance of the matter. It seems, however, that the teachers in general have failed to develop a conscious, well-formulated technique for accomplishing the work effectively and economically. They correct words mispronounced by the pupils from morning until night. They have pupils call attention to mispronunciations by their mates; they have words marked diacritically, syllabified and accented. Occasionally they gather up lists of words frequently mispronounced and give definite repetitive drill. Throughout the city they teach phonics in the primary grades, and in a few cases they teach phonics during the later grades. Much good work is being done. It can be said with equal positiveness, however, that much wasteful effort is being expended because of using methods that are ineffective. For example, to stop a pupil while he is reading or reciting to correct a word which he mispronounces is not only thoroughly bad practice for the subject that is being taught, but it is an ineffective method in the case of most pupils for training in correct pronunciation.

The teachers have not formulated the ends toward which they should strive by way of bringing about proper pronunciation. Generally the consciousness seems to be that they must drill the pupils to the correct pronunciation of particular words, as the purpose in view. Something of this needs certainly to be done. Pupils need to have a thorough understanding of phonetic matters. They need to be able to look intimately into the phonetic-content of words, and they need to have been practiced in the matter just as thoroughly as they are practiced in the spelling to an appreciation of the letter-content of words. Just as in the spelling, there should be long lists for purposes of developing the appreciation of phonetic values, and short lists to be studied intensively, made up of words frequently mispronounced, the attention being carefully and constantly focused upon the phonetic parts of the words where the pronunciation most often goes wrong. In connection with these types of exercise it will be necessary to introduce diacritical marks, syllabification, accenting, sensory

drill, etc. The immediate end of this is a knowledge of the pronunciation of specific words. A more generalized end is the appreciation of phonetic values and relationships. The work, however, should be looked upon as preliminary and not the ultimate stage of the training. It must be looked upon as being relatively ineffective in the end if it is to stop on this level of effort.

The further end of educational striving must be the development within the pupil himself of a habit of watchfulness over the words that he uses in all of his oral speech. The watchfulness must be from within; the corrections made from within, in chief measure at least, and not by teachers or other pupils, from without. When the pupil is brought to this point of watchfulness over his pronunciation and the habit of going to his pronunciation lists or the dictionary when his confidence fails him, or a habit of asking the teacher in such case, application will then be made of the understanding developed in the preliminary stages, and the watchfulness, if sufficiently stimulated to be continuous, will bring about the desirable perfection of pronunciation. Since this is so inadequately developed by the teachers of the city, perhaps we should indicate certain factors of method:

1. Devices need to be discovered for stimulating pupils in their oral work to watchfulness. The present method of correcting pupils by teachers and classmates is designed to be such a form of stimulation. In some cases it is, though the plan needs to be changed so as to retain its good points without involving the bad effects upon the other aspects of the oral work. The giving of a definite mark for pronunciation in the same way that a definite mark in the spelling of the written work is given by certain teachers, is another possible device. And there is the matter of giving special privileges or honor marks to pupils whose pronunciation shows particular excellence.

2. A second factor of method must look definitely toward the development of a habit of critical watchfulness of the pronunciation of others. Man seems to be so constituted that he can see the mote in his neighbor's eye so much more clearly than the beam in his own that it seems rather more practicable in most cases to develop his sense of what ought to be through his observation of others rather than the observation of himself; then after this consciousness of what ought to be is pretty fully developed he can be brought to make application of it introspectively to his own case. When he has become so critical and so sensitive to the pronunciation of others that mispronunciation becomes displeasing, it is a very small step indeed to ridding his own speech of those mispronunciations.

Naturally, this is a thing that must be done with care. If overdone one may become unbearably critical and fastidious, but on the other hand, if it is insufficiently done, one is not likely ever to acquire a

proper pronunciation, since one's own pronunciation is very largely a reflection of perfect examples observed in others. Considering the character of the out-of-school pronunciation of the youth of today, there is little danger of overdoing the matter in the case of most children.

As to procedure, we recommend the pupil-committee plan, each committee serving for a week or two and observing the pronunciation of the entire class. The primary purpose of this work is the education of the members of the committee to watchfulness, and to sensitiveness of ear for the pronunciation of others. The purpose is not primarily the detection of the errors of the others. This is really only a secondary purpose in the mind of the teacher, though it may at the time seem the primary purpose to the pupils of the committee. Words mispronounced by the rest of the class will be reported by the committee to the teacher in lists separate for each individual pupil. The words discovered will be used for the special conscious drill of the pupils who have mispronounced them, and will constitute a pronunciation list which each pupil is to be stimulated to watch in his future oral work.

We wish to venture the assertion that for most people pronunciation is more important than spelling, since all rightly constituted and rightly situated people will talk a great deal, but most of them will write but little. If it is desirable to develop a well-formulated technique and to give a respectable amount of program time to the development of correctness in written work, it would appear certainly to be equally desirable to develop proficiency in oral expression.

3. A third factor of method now insufficiently formulated and utilized is that of unconscious imitation. Since one's pronunciation is chiefly a reflection of the oral speech that one hears, if children heard nothing but proper pronunciation at home and in their other associations, the school would have here no task. As one teacher remarked concerning the training of children in a well-to-do American residence district: "The children in this district acquire correct pronunciation in their homes as a rule." But on the other hand, they will acquire the incorrect pronunciation of the homes and playgrounds with the same infallibility.

The teacher will employ the method in two ways. In schools where it is specially needed the teacher will make her own pronunciation and enunciation as perfect as possible, and will then give a considerable amount of time in reading to the pupils. In such schools it is probably more important that teachers read to the pupils than that the pupils read to each other, so far as training in pronunciation is concerned. Second, in such measure as possible, oral reading should be done to the pupils by those pupils of the building who are most proficient in their pronunciation. The purpose of these types of exer-

cise is to set the best available school conditions for unconscious imitation. The unconscious imitation is facilitated by the employment at the same time of the various other methods referred to which are more conscious. Both types of methods should be carried on at the same time.

### **Difficulties Encountered by Teachers**

The teachers pointed out a great variety of difficulties. Some of these can be fully overcome by the educational authorities or the teachers themselves. Some of them can be only partially overcome. With a few of them the school has little remedial influence, with the result that the schools cannot hope to develop entire proficiency in this matter. The following difficulties were mentioned by different teachers:

1. The headlong speed of pupils in their oral expression; their seemingly entire lack of self-consciousness either as to vocabulary or pronunciation, with the consequent lack of any degree of watchfulness over their mode of utterance.

2. A lazy indifference to proper pronunciation even when conscious of it.

3. A lack of knowledge of the phonetic values of letters.

4. Lack of knowledge of diacritical marking.

5. A lack of power to make application of their knowledge of diacritical marks in their pronunciation of words found in the dictionary.

6. Lack of English in the homes.

7. Indifference of the homes.

8. A lack of dictionary drill because of the absence of sets of dictionaries for the individual pupils of the classes in a great many of the buildings.

9. Nose and throat troubles.

10. Lack of time, the curriculum being already so full.

11. The hindrance of traditional pronunciation, since pupils fear the ridicule that falls on the one who violates the customs of the social group to which he belongs.

12. Reading selections that are not vital to the pupils because not upon their level of understanding.

13. Mumbling recitations, because of the pupil's not being vitally aroused in his oral expression.

14. The fact that the child has two vocabularies, one which he uses at school and another which he uses everywhere else.

15. A lack of helps, word-lists, drawn up for the purpose, and books of diacritical marks for constant reference by the pupils, etc.

These difficulties are all of them very real. In formulating plans of work the school authorities will do well to see what can be done

by way of overcoming each of them. It is the meeting with such a multiplicity of problems in connection with the training in apparently so simple a matter, and the meeting with similarly complicated problems of great number and complexity in connection with the teaching of all of the subjects that reveals the tremendous need of developing the supervisory aspects of the work. Specifically, the thing mostly needed is the liberation of the building principals from simple routine labors which can be given into the hands of teacher-clerks.



## VI

## LANGUAGE, GRAMMAR AND COMPOSITION

To these related matters Denver is giving about the usual amount of time. In many schools a separate period is set aside for the work, even in the first grade; in practically all schools, in the second grade; and in all schools beyond the second grade.

The work divides from the very beginning into two lines of effort. One is the development of a knowledge of technical language matters needed for the construction of correct sentences and paragraphs. The second is practice in the oral and written expression of thought so as to develop facility and habits of correctness. In this second type of exercise, whether oral or written, the children are supposed to find an opportunity for making application of the various technical matters learned in connection with the first line of work. For the sake of simplicity we shall call one of the lines grammar, even though it is not systematically organized in the lower grades, and the other composition.

No textbook is used for either line of work during the first four grades. During the fifth and sixth grades a text is introduced which is used as a partial basis for both lines of work. In the seventh and eighth grades a text is used which is devoted chiefly to the grammar, and gives little attention to the composition.

## Composition

The printed manual states that "training the child to express himself freely, clearly, and concisely in correct English, both oral and written, still remains the principal occupation of the grades, and nothing should be introduced that will in any material way detract from this great aim." This being the major purpose for the sixth grade, where the statement occurs, presumably it is the major purpose for all of the earlier grades as well. It is not mainly a matter of teaching grammar, but mainly a matter of providing the opportunity and proper stimulation for correct speaking and writing. This interpretation of the need is undoubtedly the correct one. Many schools are therefore developing the oral and written expression of the content-subjects like geography, literature, biography, science, etc., with the conscious purpose of training the pupils for adequate expression of the thought that is developed in connection with these different subjects. One of the best plans of work observed was where a geographical topic was taken up in class for preliminary discussion on the day of its assign-

ment, an outline of sub-topics made out, and collateral readings bearing upon the topic distributed among the pupils. The textbook study had presented some common ground of understanding for all of them. The pupils then went to the different books and each prepared to present facts bearing upon the sub-topic which he had chosen. In the next recitation various pupils presented oral reports in connected fashion on the various sub-topics. Each pupil had a real audience, since the class was not familiar with the things which he had found bearing upon his sub-topic. They were interested because the things were new. The pupil who was reporting was careful in his organization and presentation of the matter because having a real audience who wanted to understand he was interested in making them understand. The length of the reports made was variously from one to four minutes.

This plan of language teaching is based upon the sound theory that the speaker's attention must be focused fully upon his *audience*, upon the one hand, and upon the *thought*, upon the other. This plan makes chief provision for taking care of the organization of the thought, of vocabulary, sentence structure, etc. Where habits of speech are not perfected, the speaker must naturally give some incidental attention to matters of grammar and of organization, but training in expression must not be too introspective and too conscious. Certainly, this must not be the main center of attention. There can be no adequate expression except as attention is mainly objective, outward, upon audience and things discussed.

The work referred to was excellent in plan and should be made universal throughout the city in all schools and grades, and in the teaching of all of the content-subjects. The work observed was only moderately well done because of an insufficiency of reading materials to which the pupils could refer. The plan necessitates a richness of interesting, concrete reading materials in connection with subjects taken up. The plan cannot be universalized in the ways and in the degree mentioned until the necessary reading materials are at hand for the training in the various subjects and for the training in that expression which comes in connection with each of the various subjects.

Oral training in expression of this type in connection not only with the geography, but with other subjects, was observed in a number of other schools. While the best, it is not the most usual plan.

The plan of bracketing the oral and written composition with the grammar as is done in the course of study and upon the program of most schools is obstructive to good procedure. It creates the presumption in the teacher's mind that training in oral and written expression is to be effected in the so-called language class. This presumption then stands in the way of any clear recognition of the fact that the training mainly cannot take place in any such class, but must of necessity take place in those classes where children have something to say and audi-

ence that is interested in what they have to say. The arrangement creates the presumption that language is a thing apart which can be developed in isolation from the field of knowledge that provides the thought-content of the language. The result is often a devitalized make-believe training in oral and written expression in which attention is consciously devoted to the expression. Such work is so vague, purposeless and ineffective that many teachers tend to neglect it and to devote an undue amount of attention to grammar during these earlier grades.

To correct this presumption and to provide the conditions of effective expression, we recommend that training in oral and written expression be definitely taken out of the language class, for the most part, and consciously and systematically developed in connection with the teaching of the content studies. The small additional amount of time that can thus be given to these studies will be good, both for the studies and for the training in expression.

As the work is taken care of in ways recommended, it will be necessary for the pupils to have certain grammatical information, to know something about punctuation, paragraph structure, organization of the larger units, etc. There is thus left a certain amount of informational teaching concerning language, which belongs properly in the language classes. There may, in these classes, be a little composition by way of illustrating and making clear the various technical matters taught. But this should all be consciously preliminary to what is conceived as being the real training in oral and written expression. It ought not to require any large amount of time.

Where the composition work in Denver, whether oral or written, is developed within the language classes, it is not always of a devitalized, ineffective, introspective sort. Work of good quality is brought about in very frequent instances by bringing into the language classes the thought materials of some other subject. Topics like the following from geography, history, science, current events, civics, etc., have been used for the purpose: How Rubber Is Manufactured; The Story of Sir Galahad; From the Planting of the Wheat to the Flour; Columbus; Oriental Customs; Mining; Irrigation; The Early Inhabitants of England; Druids; Flies; The Pilgrims; Services Rendered by the Aeroplanes in the European War; Sanitation in Serbia; Woman Suffrage; Growth of Factories in Colorado; The United States Navy, etc., etc. While it is good to use topics of this character for the preliminary language teaching, yet on the whole it is better to develop the expression work in connection with the subject where these topics would naturally fall.

Topics of an undesirable character, but of a type which is much used throughout the city are such as the following: Description of Our Postman; My Dog; Skating; Description of the School Room; Adventures of a Penny; Description of a Postage Stamp; Description

of Each Other; Story of the Walk to School; Usefulness of Dogs; Sounds I Heard One Day at School; The Boy Who Ran Away; Why I Like Winter Better Than Summer; Stories of Pictures; Original Imaginative Stories, etc.

Most of these undesirable matters are encouraged or directly recommended by the printed course of study. Time spent upon such topics for mere linguistic gymnastics is largely time wasted. The course of study should withdraw such recommendations.

Except for the letter writing, which is necessarily written, the themes of oral and written composition will be much the same. Simply, the written work is a more formal kind of work which will receive a less amount of time and emphasis than the oral. It ought, however, to receive very much more time than is recommended in the manual. Grades seven and eight are expected to write one short composition a week. In the words of the manual: "The test of the written work should be found in its excellence and not in its length; all composition work should be brief, a maximum of seventy-five words being sufficient." This means the writing of one short paragraph a week. It is the judgment of the writer that the expression work cannot be well done in connection with the various subjects except where the children have a great richness of ideational experience, from reading, observation, and discussion. In their oral work, children ought frequently to talk consecutively for from three to five minutes. As reports of this character are written out, to limit the expression to a maximum of seventy-five words is simply to stifle the work.

## Grammar

The relative emphasis upon grammar and composition in different buildings is very different. Sometimes it is the composition that is chiefly emphasized. More often, it is the grammar. The course of study recommends that in the seventh and eighth grades the time be divided about equally between the two. This appears to be the case in a few of the buildings. It is not apparently the rule, however. Usually the grammar gets the larger amount of time.

As indicated, both by the printed manual and by the practice in the best schools, the city is clearly tending toward making the grammar teaching preparatory for and incidental to the oral and written expression. Only those things are to be taught, it is recommended, which can be serviceable to the children for correct speech. "The essentials are as follows: (1) Ability to analyze sentences; (2) ability to recognize the parts of speech; (3) ability to discover and state the construction of words in sentences; (4) knowledge of the common inflections." The course states also that "no time need be spent on dis-

puted or complicated constructions. Sentences used should be plain, common English, and points not clear should be avoided."

The tendency to minimize the emphasis upon the formal grammar and to confine it to essentials is commendable. The course, however, is so brief that teachers are guided mainly by the treatment of the textbook. This is, in the judgment of most of the teachers, not adapted for doing the work in the spirit of the course of study. The treatment is rather beyond the comprehension of the majority of the pupils. The sentences presented as the basis of work are too difficult and complicated. The result is that while purposes appear to have been well-defined in the course of study, and relative emphasis well judged, yet owing to the materials and implications of the textbook, which is really the detailed course of study, a much larger proportion of time and effort is given to the subject than is desirable.

A simpler treatise needs to be substituted for the present one. But even after this is done, it is probable that the textbook should be mainly a reference book for giving organization to the subject, and for use in summarizing matters after they have been learned in rather more effective ways. The basis of the teaching should probably be carefully selected and carefully graded lists of sentences. Using such lists of sentences for teaching the four things enumerated, the first three of the goals enumerated can certainly be reached more effectively than in any other way, and the best foundation is made for those further necessary studies of inflection and grammatical concord.

One of the Denver teachers was discovered already to have compiled sets of sentences for drill, illustrating the different topics and sentence relationships. It is possible that others in the city have done the same thing. A little co-operative effort by way of further improving the lists ought to make them ready for printing and distribution through the schools. Many teachers in the city express the need of such helps.

About thirty recitations in grammar were visited. Usually the entire class exercise was observed. In grammar, as in practically every subject, there is very great diversity through the city, both in plan of procedure and in effectiveness of the work. This great diversity is not due to conscious and intended experimentation on the part of the educational authorities by way of discovering the plans that work best. It is clearly due to the fact that there has been a lack of concerted directive effort. The teachers coming into the work with different traditions and different experience, and with different degrees of training, have been left to their own devices in a degree that is unfair, both to them and to the pupils. As a result, there is good work, fair work, and poor work in the schools.

No really superior work was observed in this subject, though in a city where such diversity exists and where teachers are left so fully



to their own initiative, it doubtless does exist in certain schools. A considerable quantity of quite good work was observed, *i. e.*, the work attempted was work that the children need; it was graded and adapted to the degree of maturity of the children; it was rather fully experiential, rather than merely the learning of technical facts, definitions, rules, etc.; a fairly voluminous quantity of grammatical experience was provided for each of the class exercises; most or all of the members of the class were kept active mentally during the course of the exercise; pupils understood the things met with, and were confident in their understanding; they were alert, awake, interested, and intellectually active, and were thereby assimilating their knowledge.

In just as many cases the work was very deficient in effectiveness, *i. e.*, the teacher appeared to have no conception as to what should be aimed at, or what the work was for; their only conception was, it appeared, that the textbook was to be taught; they were trying to secure abstract fact-learning instead of grammatical experience; the exercises were badly graded as presented solely by the textbook, and were heaping accumulated difficulties upon the pupils more rapidly than the pupils were prepared to meet them, while the pupils were usually good-naturedly and even sometimes industriously trying to learn the facts and to overcome the difficulties, there was usually, on the part of the class, a great deal of guessing and floundering; the work appeared distasteful and uninteresting to the pupils; they tended during the exercise to be passive, inert, intellectually indolent; they were not assimilating the knowledge, partly because they were not really getting it, and partly because they were not active. Usually in classes of this type the teacher appeared to be working even more strenuously and earnestly than in grammar classes where good work was being done. The fault was usually no lack of good will, of industry, of conscientiousness, of desire to secure the best possible results. Simply, the teachers did not know what to do, and the principals in such a large number of cases were not telling them what to do in order that their work might be effective, and the principals were not securing the needed helps for effective work. The principals have been having to give such a large portion of their time to clerical routine duties that they have had so little time for supplying the actual leadership in the work. The fault here as everywhere, where the work is ineffective, rests ultimately back upon the chaotic organization and lack of business-like management, during the past decade or so, on the part of those who have borne the ultimate responsibility for responsible organization of the entire school system. One does not sufficiently realize the seriousness, even tragedy, of the situation until one goes into the classrooms and observes teachers expending the last ounce of their energy in futile attempts to teach the right things in wrong ways, and failing because they are using wrong ways; failing because they lack the leadership



and assistance which they have a right to expect. Let those in authority do their work efficiently before they attempt to dismiss teachers because the latter are inefficient. The primordial inefficiency for many years, the tap-root of all other inefficiency, has been with those who have been responsible for the lack of organization and responsible leadership within the system.

There is another major defect in the teaching of grammar in the city which is very common. The end of grammar is too often looked upon as being not the habit of making application of one's knowledge, but only the possession of a certain body of technical knowledge. The end is not a habit of constructing well-rounded, correct sentences, properly capitalized and punctuated; it is rather only a knowledge that can be explained and recited upon concerning parts of speech, construction of words, uses of periods, capital letters, etc. The major purpose is to see that this knowledge is learned, not that good language habits are practiced. The training in grammar is therefore conceived to be mainly that which goes on within the grammar recitation and study period. The oral and written expression of the pupils in connection with all of their activities is not consciously looked upon as offering the major opportunity for the training in grammar. It is generally expected by teachers that children should not make mistakes in their speech or writing during school hours. It is one thing, however, to expect this, and quite another thing systematically to use all of the expression work for the conscious and definite purpose of developing habits of watchfulness as to the character of sentences that they construct.

As a matter of fact, the work in the grammar classes proper can have no purpose beyond the giving of certain necessary preliminary ideas concerning grammatical relationships. One is educated in grammar *only as these ideas are put to work*, and as they result in the formation of habits. This putting of the ideas to work and the consequent formation of habits can take place only where children are expressing their ideas. The culminating training in grammar, therefore, cannot occur within the grammar class, but must occur in connection with all of the oral and written expression of the pupils, in all of their classes and in their general social relationships.

The major problem is to make pupils sensitive to grammatical error, to feel the crudity of language that is grammatically incorrect, and to be watchful against committing these errors against linguistic good taste. As one thoughtful Denver teacher phrased the matter: "The object always should be to try to make the child his own critic." This demands a pedagogy of grammar that has been but little developed within the city. The work of the teacher from whom the quotation is made was not observed by the writer, but from her full statement of her method of making the children sensitive to grammatical incor-

rectness and of stimulating them to watchfulness, it is clear that she has a thorough understanding of the pedagogy of the training of this type, and is competent to assume the leadership, along with others of the same insight, in improving the work in the city.

It is much more important that the educational authorities find those individuals within the city system who best know what should be done than it is that we make recommendations as to the details of procedure. Those individuals are qualified not only to point out what ought to be done, but to assume a large part, at least, of the leadership in the year-long problem of improving the details of the work. This applies not only to the grammar, but to all subjects.

Since the leadership of the type just recommended will be putting this aspect of the grammatical training into safe hands, we shall here confine ourselves to making only one or two suggestions further. The teacher above quoted further remarked: "The criticisms of fellow pupils are often more keenly felt than those of the teacher. In fact, they are so keenly felt that the method has to be used with discernment and care." It further must be employed in ways that will not interrupt the current of thought in connection with the regular work of the classes. It must not be too continuous. It must be managed in such way that it will create sensitiveness and stimulate watchfulness and not produce mere callousness and indifference—leaving the individual in a worse condition than if nothing had been done. But notwithstanding the endless complexity of the pedagogy of the plan, it must be developed and used if the work is to be effective. We would recall our discussion of the possibilities of the use of the pupil-committee as a factor of responsible performance. They can read papers written by the class, and the exercise of watchfulness in the reading of those papers trains them for watchfulness for errors in their own work. While this assists the teacher by taking an impossible burden of mechanical paper-reading off her shoulders, the primary purpose is not this student help, but it is student training. The same, or another committee, can at the same time be watching the oral expression of pupils for a week or other such time for which it is appointed. The errors observed on the part of each individual pupil can be laid up against the expression of that pupil. He can know the things against which he must be on guard. He can be given the individual training needed for avoidance of the various errors. He can appreciate the need of the necessary technical information and is thus made receptive to the efforts of the teacher.

Very many of the elements of such a program are already being employed by teachers within the city. Certain teachers are already using the pupil-help for the reading of papers, but not always with sufficient consciousness of the educational value of it. In other cases, teachers are having the pupils select lists of errors, using methods that

are unobtrusive but effective, and which do not interrupt the general current of the work. For example, one teacher said: "Once a week the children are delighted to bring to class incorrect sentences which they have heard during the week. This inspires the child to try to use correct expressions himself." As a matter of fact, it is the criticism of others that constitutes the first step toward effectiveness of self-criticism. Human nature is so made that man must see the beam in his brother's eye before he is properly impelled to look for the mote within his own.

## MEASURING THE QUALITY OF THE COMPOSITION

(Mr. W. H. Willing)

The achievement of the Denver elementary school pupils in written English composition was investigated through a test given to grades 4-A, 5-A, 6-A, 7-A and 8-A of nineteen representative buildings. Since the test was given within a few weeks of the end of the semester the work of these half-year grades represented very closely the accomplishment of the fourth, fifth, sixth, seventh and eighth years of school work respectively. The whole school system was sufficiently represented by the schools tested, for they held more than half the enrollment in these grades.

The children were asked to write on "An Exciting Experience." In each case a number of more specific topics were written on the blackboard by way of helping pupils to locate in their memories some appropriate incident. This they seemed to do without difficulty. All classes were given twenty minutes for the writing.

The compositions being all of a single type, it was thought best to have a measuring scale devised for use with this type. It was therefore considered advisable to derive a measuring scale from the compositions themselves. Such a scale, it was foreseen, might be somewhat more crude in a scientific or statistical sense than the Hillegas-Thorndike Scale, for instance, but it promised to be more serviceable for the purpose.

It is not necessary in this connection to give a detailed account of the somewhat complicated derivation of the scale. With certain necessary changes, the general method was that which has been employed in the derivation of numerous scales, most notably the Ayres' Scales in handwriting and spelling. The instrument itself, as given below, consists of eight compositions from the materials furnished by the test, ranging by approximately equal steps, both as to formal and as to content values, from poorest to best. The grades: 90(85-94), 80(75-84), 70(65-74), 60(55-64), 50(45-54), 40(35-44), 30(25-34) and 20(15-24) have been arbitrarily assigned. The papers of the test were graded by comparing them with the samples on this scale and giving each the

scale value to which it most nearly approached. The interpolated markings: 85, 75, 65, etc., were also used for convenience.

## THE SCALE

### A-90

The most exciting experience of my life happened when I was but five years of age. I was riding my tricycle on the top of our high terrace. Beside the curbing below, stood a vegetable wagon and a horse. Suddenly I got too near the top of the terrace. The front wheel of my tricycle slipped over and down I went, lickety-split, under the horse standing by the curbing. I had quite a high tricycle and the handlebars scraped the horse's stomach, making him kick and plunge in a very alarming manner. I was directly under him during this, but finally I rolled over out of his way and scrambled up. I looked at my hands! Most of the first finger and part of the thumb of my left hand were missing. The horse had stepped on them. I had endured no sensation of pain before this, but now my mangled hand began to hurt terribly. I was hurried to the hospital and operated on, and now you would hardly notice one of my fingers is missing. I certainly have good cause to congratulate myself on my good fortune in escaping with as little injury to myself as I did, for I might have been terribly mangled in my head or body.

Number of mistakes in spelling, punctuation and syntax per hundred words—0.

### B-80

Near our ranch in Fort Logan there was a chicken ranch. On day my sister and I went up to the chicken ranch on our horses. Coming back there was a road leading from our house to the main road and along this road were half rotted stumps. On every one of these stumps what do you think we saw. We saw snakes! snakes! snakes! I suppose these snakes were shedding their skins they-were of every color, shape and size. But when sister and I saw these snakes we whipped our horses into a gallop and away we went just as hard as we could go. When we got to the house we went in and mamma couldn't get us out the house that day. I was so scared that I believe I dreamed about snakes for a month.

Number of mistakes in spelling, punctuation and syntax per hundred words—5.

### C-70

When I was in Michigan I had an exciting thing happen or rather saw it, it was when the big steamship plying between Chicago and Muskegon was sunk about 7 o'clock in the evening. It caught on fire with a load of cattle and products for the market on board, one of the lifeboats carrying some of the few people who were on board landed at our pier. The "whaleback," steamer which goes between Chicago and Muskegon was two hours later in coming than the freighter and was stopped to clear up the wreckage. all of the cattle and products and an immense cargo of coal were lost, but there were only two people lost. the ship tried hard to get to port with her cargoe but, could not reach it. The next morning we found planks, and parts of the wreck on the beach. Our cottage was at the top of a cliff and it was just one hundred feet to the lake from our cottage, we had a beautiful view, and the sight of the fire on the horizon was a beautiful sight (though it was pitiful.).

Number of mistakes in spelling, punctuation and syntax per hundred words—8.

### D-60

One time when mother, some girl friends and myself were staying in the mountains. An awful storm came up. At the we were way up the mountain. The lighting flashed and the thunder roared. We were very frightened for the cabin we were staying at was at the foot of the mountain. We didn't have our coats with us for it was very warm when we started. There were a few pine trees near us so we ran under them. They didn't do much for good for the rain came down in torents. The rain came down so hard that it uprooted one of the trees. Finely it began to slack a little, So we thought we would try and go back. About half was down the mountain was a little hut. We started and when got about half way down it began to rain all the harder. We didn't know what to do for this time there wasn't any trees to get under. We desided to go on for the nearest shelter was the hut. Finely we got there cold and wet to the skin.

Number of mistakes in spelling, punctuation and syntax per hundred words—11.

## E-50

One time mother and father were going to take sister and I for a long ride thanksgiving. We had to go 60 miles to get there. When sister and I herd about it we were very glad. It was a very cold trip. We four all went in a one seated automobile. Dady drove and mother held me and sister sat on the top the top was down. Mother could not hold sister for she was two heavy. When we got there they had a hot fire ready for us and a goose dinner. We were there over night. In the morning it was hot out. This was on a farm. Sister and I got to go horse-back riding. It was lots of fune. They had children. The children were very nice. Our trip home was very cold. When we got home it had snod.

Number of mistakes in spelling, punctuation and syntax per hundred words—14.

## F-40

My antie had her barn trown down last week and had all her chickens killed from the storm. Witch happened at twelve oclock at night. She had 30 chickens and one horse the horse was saved he ran over to our house and claped on the door whit his foot. When we saw him my father took him in barn where he slepped the night with our horse. When our antie told us about the accident we were very sorry the next night all my anties things were frozen. The storm blew terrible the next morning and I could not go to school so I had to stay home the whole week.

Number of mistakes in spelling, punctuation and syntax per hundred words—17.

## G-30

The other day when I was rideing on our horse the engien was comeing and he got frightened so he through me down and I broke my hand.

And the next thing I done was I went to the docter and he put some bandage on it and he told me to come the next day so I came the next day and he toke the bandage off and he look at it and then it was better.

Number of mistakes in spelling, punctuation and syntax per hundred words—23.

## H-20

Deron the summer I got kicked and sprain my arm. And I was in bed of wkeeks And it happing up to Washtion Park I was going to catch some fish. And I was so happy when I got the banged of I will nevery try that stunt againg

Number of mistakes in spelling, punctuation and syntax per hundred words—30.

The grading was all done by the single member of the survey corps who managed the test and devised the measuring scale. The median accomplishment of each class is indicated in the following table:

TABLE III

	4-A Grade		5-A Grade		6-A Grade		7-A Grade		8-A Grade		Average All Grades	
	Median Quality	Medium No. Words	Median Quality	Medium No. Words	Median Quality	Medium No. Words	Median Quality	Medium No. Words	Median Quality	Medium No. Words	Quality	No. Words
Alcott .....	37.5	99	45.0	110	55.0	163	59.2	168	61.3	195	51.6	147
Ashland .....	32.5	78	35.8	135	51.3	120	52.5	124	60.8	174	46.6	126
Boulevard .....	30.0	103	45.0	104	51.3	138	57.5	140	67.5	198	50.3	137
Bryant .....	27.5	74	41.3	100	47.5	128	51.3	145	58.3	119	45.2	113
Cheltenham .....	30.8	74	42.5	87	50.0	120	57.5	154	67.5	146	49.7	116
Clayton .....	28.8	75	42.5	100	50.0	90	....	...	68.3	179	....	...
Columbine .....	30.8	118	50.0	175	52.5	153	60.8	130	65.0	193	51.8	154
Corona .....	39.2	70	55.0	135	60.0	155	67.5	171	62.5	175	56.8	141
Ebert .....	37.5	105	45.8	200	47.5	185	62.5	207	72.5	235	53.2	186
Edison .....	30.8	123	39.2	152	48.5	143	57.5	153	61.3	198	47.5	154
Elmwood .....	35.0	93	47.5	138	60.0	130	57.5	175	60.8	218	52.2	151
Evans .....	26.5	80	45.5	145	52.5	150	61.5	160	62.5	190	50.1	145
Franklin .....	35.0	85	38.8	85	45.0	140	55.0	153	60.0	213	46.8	115
Garden Place .....	18.3	73	37.5	105	40.0	135	....	...	....	...	....	...
Lincoln .....	32.5	95	42.5	146	51.5	130	50.8	208	60.8	198	47.6	155
Smedley .....	27.5	75	46.5	115	50.0	204	57.5	233	70.0	205	50.3	166
Villa Park .....	35.0	101	36.5	90	50.8	143	62.5	135	62.5	180	49.7	130
Whittier .....	30.8	67	48.8	87	55.8	131	65.0	140	60.8	138	52.2	113
Wyman .....	42.5	100	45.0	141	50.0	165	57.5	148	63.5	202	51.7	151
SYSTEM .....	32.2	88	44.7	118	50.9	142	60.0	158	63.5	193	50.3	140



Properly to appreciate the results they must be arranged so as to permit of comparisons of classes of the same standing in different schools. The middle 50 per cent of the schools show normal performance for the city as a whole. Those in the highest quarter have reasons to congratulate themselves on the performance of their pupils, though the schools would first do well to test out the matter further, using the scale herewith provided. Those in the lowest quarter are working under difficulties of some kind, which need to be found and removed. It must be mentioned, however, that the findings in the case of these lowest schools should first be checked up by means of a second or third test by the school authorities. Many factors enter in; the single test is therefore not always fair to every school. A first test should always have the corroboration of a second one, or even a third.

**TABLE IV**  
**Median Quality of Compositions**

4-A		5-A		6-A	
Wyman	43	Corona	55	Corona	60
Corona	39	Columbine	50	Elmwood	60
Alcott	38	Whittier	49	Whittier	56
Ebert	38	Elmwood	48	Alcott	55
Elmwood	35	Evans	48	Columbine	53
Franklin	35	Smedley	47	Evans	53
Villa Park	35	Ebert	46	Lincoln	52
Ashland	33	Alcott	45	Ashland	51
Lincoln	33	Boulevard	45	Boulevard	51
Cheltenham	31	Wyman	45	Villa Park	51
Columbine	31	Cheltenham	43	Cheltenham	50
Edison	31	Clayton	43	Clayton	50
Whittier	31	Lincoln	43	Smedley	50
Boulevard	30	Bryant	41	Wyman	50
Clayton	29	Edison	39	Edison	49
Bryant	28	Franklin	39	Bryant	48
Smedley	28	Garden Place	38	Ebert	48
Evans	27	Villa Park	38	Franklin	45
Garden Place	18	Ashland	36	Garden Place	40

7-A		8-A		Average All Grades	
Corona	68	Ebert	73	Corona	57
Whittier	65	Smedley	70	Ebert	53
Ebert	63	Clayton	68	Elmwood	52
Villa Park	63	Boulevard	68	Whittier	52
Evans	62	Cheltenham	68	Columbine	52
Columbine	61	Columbine	65	Wyman	52
Alcott	60	Wyman	64	Alcott	52
Boulevard	58	Corona	63	Boulevard	50
Cheltenham	58	Evans	63	Smedley	50
Edison	58	Villa Park	63	Evans	50
Elmwood	58	Alcott	61	Cheltenham	50
Smedley	58	Edison	61	Villa Park	50
Wyman	58	Ashland	61	Lincoln	48
Franklin	55	Elmwood	61	Edison	48
Ashland	53	Lincoln	61	Franklin	47
Bryant	51	Whittier	61	Ashland	47
Lincoln	51	Franklin	60	Bryant	45
		Bryant	58		



The difference between schools when the medians of all five grades are averaged are not so impressive, since few schools show consistent work from grade to grade. Comparison brings the averages rather close together. Still the difference in accomplishment between schools of the upper quarter and of the lower quarter, as shown in Table X-C, is definite. Corona achieves an average in this work a whole scale step higher than the three last schools in rank. The average of the four schools in the upper quarter is three-fourths of a scale step above the average of the four schools in the lower quarter.

It is not possible fully to explain low rank on the basis of home language or economic and social conditions. It is true that only one of the so-called foreign schools achieves median merit in English composition, but on the other hand, neither do five of the English schools do any better. The "foreign" schools—Smedley, Cheltenham and Villa Park—all rank above the thoroughly English schools—Lincoln, Edison, Franklin and Ashland.

The quantity of work done in the twenty minutes is probably not so important as the quality. It is significant, however, since it represents facility of written expression. The tables that follow seem to indicate that the classes in some schools write with far greater ease than the classes of other schools. The tables—if corroborated by further tests—reveal the schools in which greater attention needs to be given to written expression, and also the schools doing the best work, to which they may well go by way of obtaining suggestions as to what to do:

**TABLE V**  
**Number of Words Written in Twenty-five Minutes**  
**(Fractions Omitted)**

4-A		5-A		6-A	
Edison	123	Ebert	200	Smedley	204
Columbine	118	Columbine	175	Ebert	185
Ebert	105	Edison	152	Wyman	165
Boulevard	103	Lincoln	146	Alcott	163
Villa Park	101	Evans	145	Corona	155
Wyman	100	Wyman	141	Columbine	153
Alcott	99	Elmwood	138	Evans	150
Lincoln	95	Ashland	135	Edison	143
Elmwood	93	Corona	135	Villa Park	143
Franklin	85	Smedley	115	Franklin	140
Evans	80	Alcott	110	Boulevard	138
Ashland	78	Garden Place	105	Garden Place	135
Clayton	75	Boulevard	104	Whittier	131
Smedley	75	Bryant	100	Elmwood	130
Bryant	74	Clayton	100	Lincoln	130
Cheltenham	74	Villa Park	90	Bryant	128
Garden Place	73	Cheltenham	87	Ashland	120
Corona	70	Whittier	87	Cheltenham	120
Whittier	67	Franklin	85	Clayton	90
7-A		8-A		Average All Grades	
Smedley	233	Ebert	235	Ebert	186
Lincoln	208	Elmwood	218	Smedley	166
Ebert	207	Franklin	213	Lincoln	155
Elmwood	175	Smedley	205	Columbine	154
Corona	171	Wyman	202	Edison	154
Alcott	168	Boulevard	198	Elmwood	151
Evans	160	Edison	198	Wyman	151
Cheltenham	154	Lincoln	198	Alcott	147
Edison	153	Alcott	195	Evans	145
		Columbine	193		
Franklin	153	Evans	190	Corona	141
Wyman	148	Villa Park	180	Boulevard	137
Bryant	145	Clayton	179	Villa Park	130
Boulevard	140	Corona	175	Ashland	126
Whittier	140	Ashland	174	Cheltenham	116
Villa Park	135	Cheltenham	146	Franklin	115
Columbine	130	Whittier	138	Bryant	113
Ashland	124	Bryant	119	Whittier	113

The large variations in the character of the work indicated by these tables is what one would expect to find from the great diversity of emphases and methods employed in different schools in the training in written expression. The figures reveal the need of supervisory assistance in a number of schools.

## VII

### PENMANSHIP

(Mr. Frank N. Freeman)

The course of study in penmanship in the Denver public schools conforms in general to the more progressive practice throughout the country. The system is the common arm-movement system. The instruction book which is used contains a well-organized, progressive system of exercises. The practice differs from some of the most advanced systems in failing to make large differentiation between the kind of drill given to the primary grade children as compared to those in the upper grades. Theoretical considerations are strongly in favor of the giving much less exacting drill to the younger children, and this practice is successfully followed in some of the large cities of the country. The amount of time devoted to writing in Denver is somewhat greater than the median practice throughout the country. One hundred minutes a week is the median time given to penmanship in Denver. This is one-third more than the more common practice of seventy-five minutes per week.

Comment upon the results of the handwriting work will be based entirely upon a test which was given in all of the schools. The test was so conducted that it is possible to obtain measures of the form and the speed of the pupil's writing. The form was recorded in terms of the Ayres' Handwriting Scale, and the grading was done by an experienced grader. The speed is given in terms of letters written per minute.

The detailed results of the test for all of the schools of the system are given in Table I. This table is to be read as follows: In the third grade of the Alcott School the average form of the writing was 26.3, and the average speed was 28.8 letters per minute, etc. The medians for the system as a whole are represented at the bottom of the table.

The significance of these medians can best be understood by reference to Chart I, in which they are presented in comparison with the average attainment in fifty-six of the larger cities of the country. The light continuous line represents the speed in the Denver schools, and the light broken line the form. The heavy lines represent the standard. The outstanding fact which this chart makes clear is that while the speed is nearly up to the average for the fifty-six cities, the form is very far below it. This is particularly true in the grades from the third to the sixth. There is reason to think that the standard of form for the second, third, and fourth grades is somewhat too high, but experience in other cities which have been surveyed, and have been given exactly the same type of test, indicates that the results in the upper grades in Denver are decidedly deficient in the matter of form.

TABLE VI

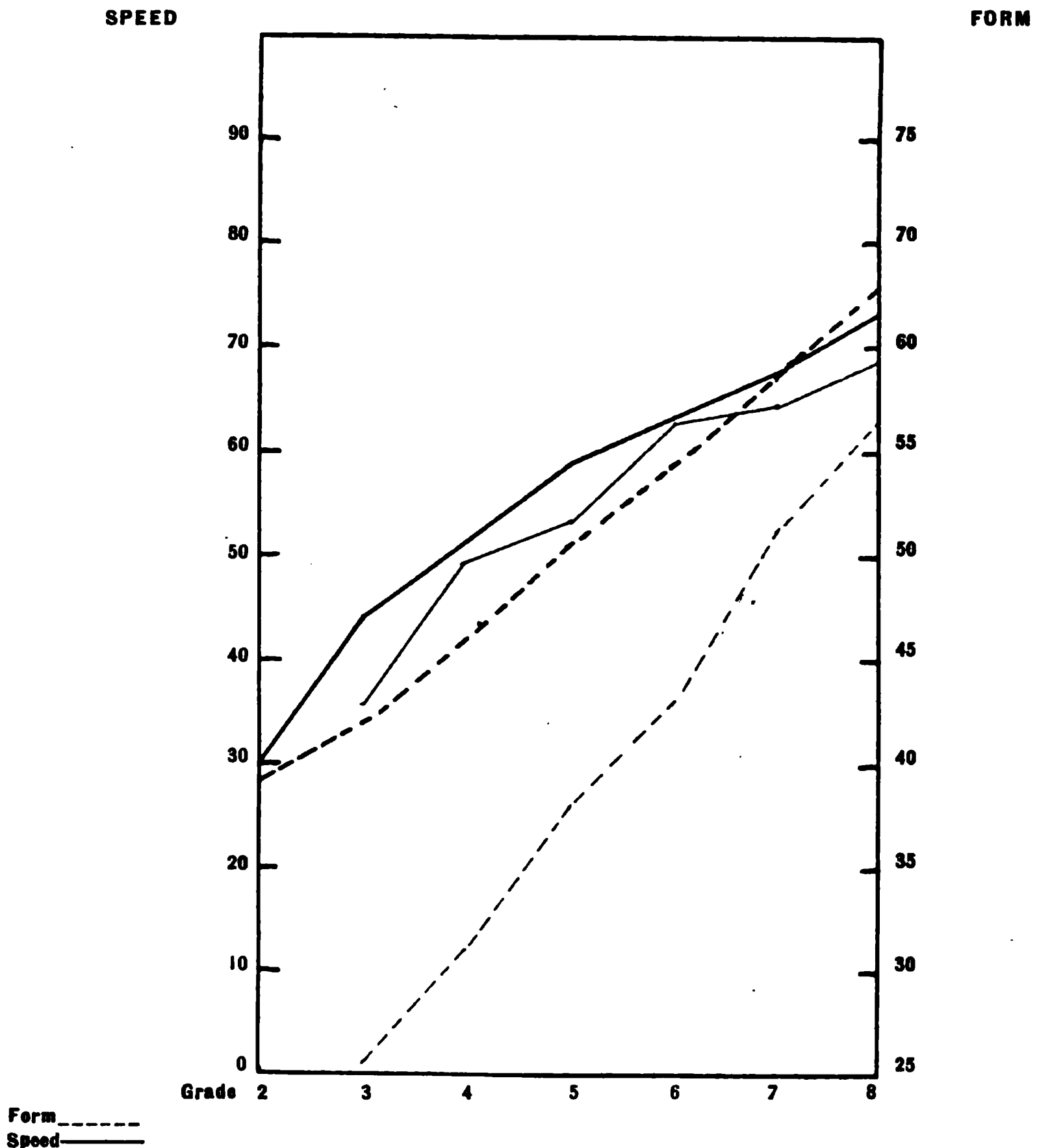
## Scores in Form and Speed in Each School

(The columns headed F. give the scores for form, and the columns headed S. the scores for speed.)

SCHOOL—	Third		Fourth		Fifth		Sixth		Seventh		Eighth	
	F.	S.	F.	S.	F.	S.	F.	S.	F.	S.	F.	S.
Alcott .....	26	29	25	44	36	50	40	59	53	60	<u>66</u>	<u>55</u>
Ashland .....	28	37	34	<u>37</u>	39	53	46	66	53	66	<u>55</u>	<u>66</u>
Berkeley .....	26	32	30	<u>40</u>	36	<u>42</u>	35	60	46	63	57	74
Boulevard .....	24	37	35	<u>51</u>	43	<u>53</u>	<u>36</u>	62	57	65	59	78
Bromwell .....	26	30	30	52	45	58	45	64	49	78	52	76
Bryant .....	26	<u>25</u>	32	50	40	60	43	61	52	66	<u>63</u>	<u>59</u>
Byers .....	26	30	27	58	<u>29</u>	<u>69</u>	35	70	52	68	<u>60</u>	<u>75</u>
Central .....	26	28	28	45	29	48	35	56	52	<u>49</u>	53	63
Cheltenham .....	26	42	41	52	40	53	52	61	<u>70</u>	<u>58</u>	<u>79</u>	<u>60</u>
Clayton .....	30	29	28	<u>34</u>	43	<u>36</u>	42	<u>48</u>	<u>43</u>	50	<u>52</u>	<u>65</u>
Columbian .....	23	50	25	51	33	68	34	74	44	78	62	66
Columbine .....	24	47	26	50	35	65	43	63	51	73	<u>42</u>	<u>80</u>
Corona .....	26	38	31	49	39	49	51	64	65	65	59	82
Ebert .....	23	37	34	<u>29</u>	34	55	45	68	59	70	<u>49</u>	<u>87</u>
Edison .....	25	37	31	43	38	45	44	62	64	63	<u>48</u>	74
Elmwood .....	24	29	31	49	33	50	43	66	43	75	<u>44</u>	<u>83</u>
Emerson .....	25	43	28	54	43	55	47	58	49	65	57	<u>51</u>
Evans .....	28	48	38	43	48	55	56	55	54	66	64	<u>63</u>
Fairmont .....	23	42	26	50	30	61	43	62	55	63	60	70
Franklin .....	26	29	33	52	39	64	41	62	45	<u>56</u>	<u>52</u>	<u>83</u>
Garden Place .....	23	28	31	53	34	60	35	76	45	71	<u>50</u>	<u>89</u>
Garfield .....	27	37	28	57	36	60	35	69	<u>40</u>	70	<u>50</u>	<u>80</u>
Gilpin .....	25	34	31	50	38	46	52	65	58	66	66	79
Aaron Gove .....	24	32	27	47	32	52	38	58	<u>44</u>	67	<u>50</u>	<u>63</u>
Grant .....	24	35	33	51	38	45	43	73	59	64	57	<u>56</u>
Hyde Park .....	24	37	28	50	34	65	43	67	44	58	<u>47</u>	<u>68</u>
Ironton .....	35	39	36	50	44	43	<u>64</u>	<u>48</u>	..	..	..	..
Lincoln .....	25	38	30	56	32	60	40	67	59	83	60	60
Logan .....	26	36	35	58	36	57	44	56	57	63	64	67
McKinley .....	29	35	43	50	38	53	37	52	49	69	55	72
Milton .....	24	30	37	43	34	49	39	52	45	62	59	<u>54</u>
Mitchell .....	30	<u>23</u>	30	<u>30</u>	35	55	46	59	50	57	55	<u>68</u>
Montclair .....	23	31	39	54	38	54	40	62	<u>70</u>	<u>55</u>	65	64
Myrtle Hill .....	26	36	35	63	41	67	46	71	53	75	54	63
Park Hill .....	24	37	40	43	45	55	43	57	51	70	54	72
Sheridan .....	29	40	26	43	38	55	33	63	<u>44</u>	<u>54</u>	67	69
Sherman .....	24	28	33	46	31	52	36	65	46	68	56	68
Smedley .....	25	34	32	40	40	47	34	63	46	75	54	68
Steele .....	27	33	27	46	41	54	47	64	55	58	64	79
Swansea .....	25	37	27	53	31	60	36	73	<u>34</u>	73	62	82
24th Street .....	29	30	29	52	29	70	41	64	<u>38</u>	<u>81</u>	56	62
Valverde .....	28	37	42	45	46	55	48	72	50	78	63	78
Vassar .....	24	27	30	42	<u>50</u>	<u>42</u>	<u>54</u>	<u>49</u>	<u>58</u>	<u>54</u>	59	<u>48</u>
Villa Park .....	25	35	29	50	29	51	37	58	57	60	<u>43</u>	<u>77</u>
Washington .....	36	48	33	54	..	..	<u>30</u>	<u>72</u>	56	65	..	..
Webster .....	27	32	36	43	43	44	50	60	..	..	..	..
Whittier .....	25	41	29	55	47	53	49	70	50	59	54	78
Wyman .....	25	47	34	47	43	47	49	54	49	67	65	69
<u>Medians</u> .....	26	36	31	50	38	54	43	63	51	66	57	69

The second question which may be asked in regard to the results of the penmanship teaching concerns the degree of uniformity in the practice in the different schools. In the table which gives the detailed results the scores of those grades which deviate considerably from the median are underlined. In those cases in which there appears to be an excess in quality at the expense of speed or in speed at the expense of quality, the two scores for the grade are underlined with a single line.

CHART I—MEDIAN RANK OF DENVER SCHOOLS

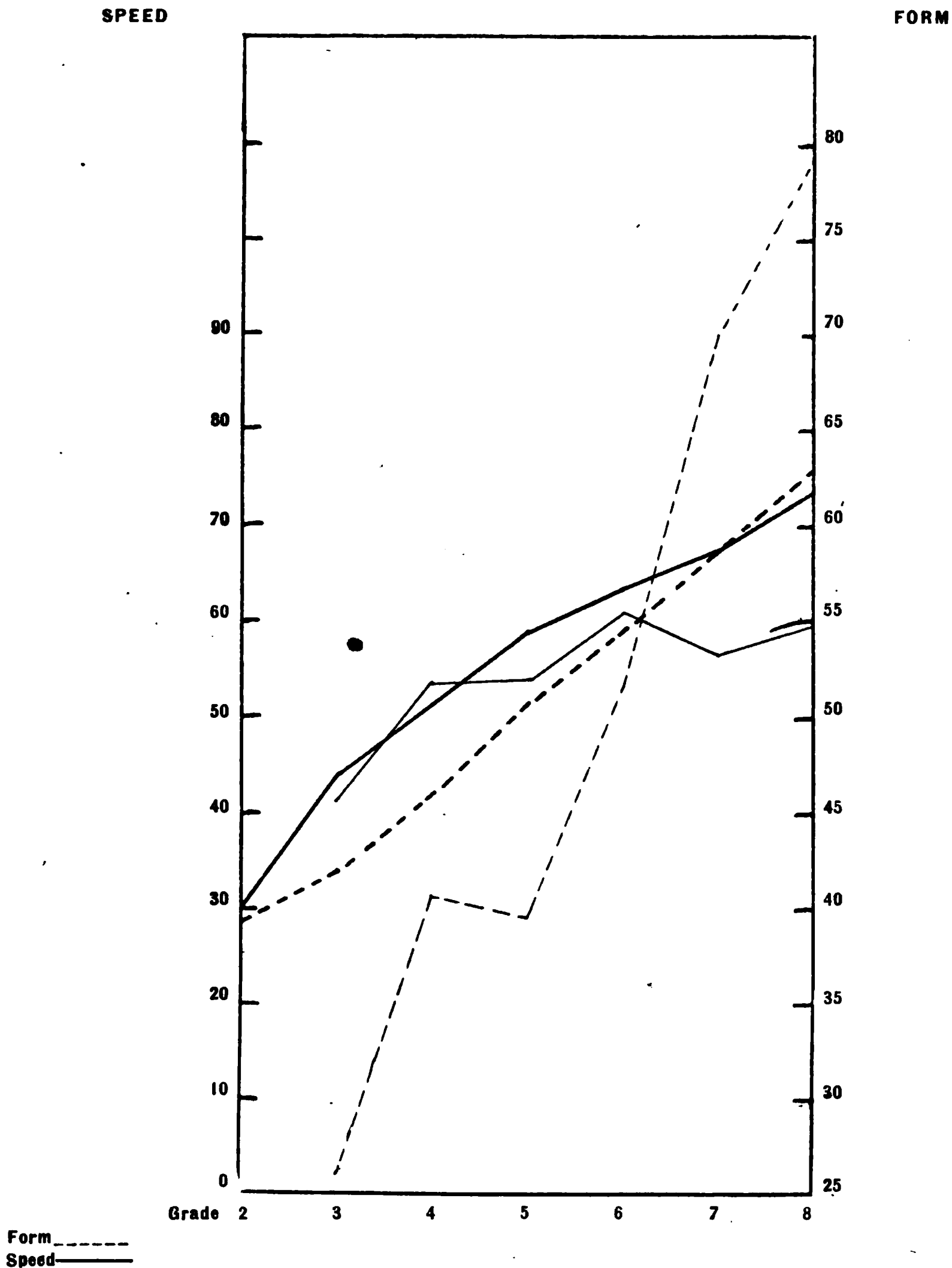


To illustrate the procedure, the score in speed in the fourth grade of the Ashland School is 37, which is distinctly below the median of 49.6. This score is therefore underlined. The scores for form and speed in the eighth grade of the Alcott School deviate from the median in opposite directions. The form is distinctly above the median, and the speed distinctly below. These two scores are therefore underlined with a single line. The opposite condition is seen in the eighth grade of the Columbine School, in which the score for form is 41.8, decidedly

below the median, and the score for speed, 80, which is decidedly above the median.

In Charts II to IV illustrative cases of large deviations from the median of the city as a whole are shown. In the Cheltenham School form is very greatly above the median, while in the upper grades the

CHART II—CHELTENHAM SCHOOL



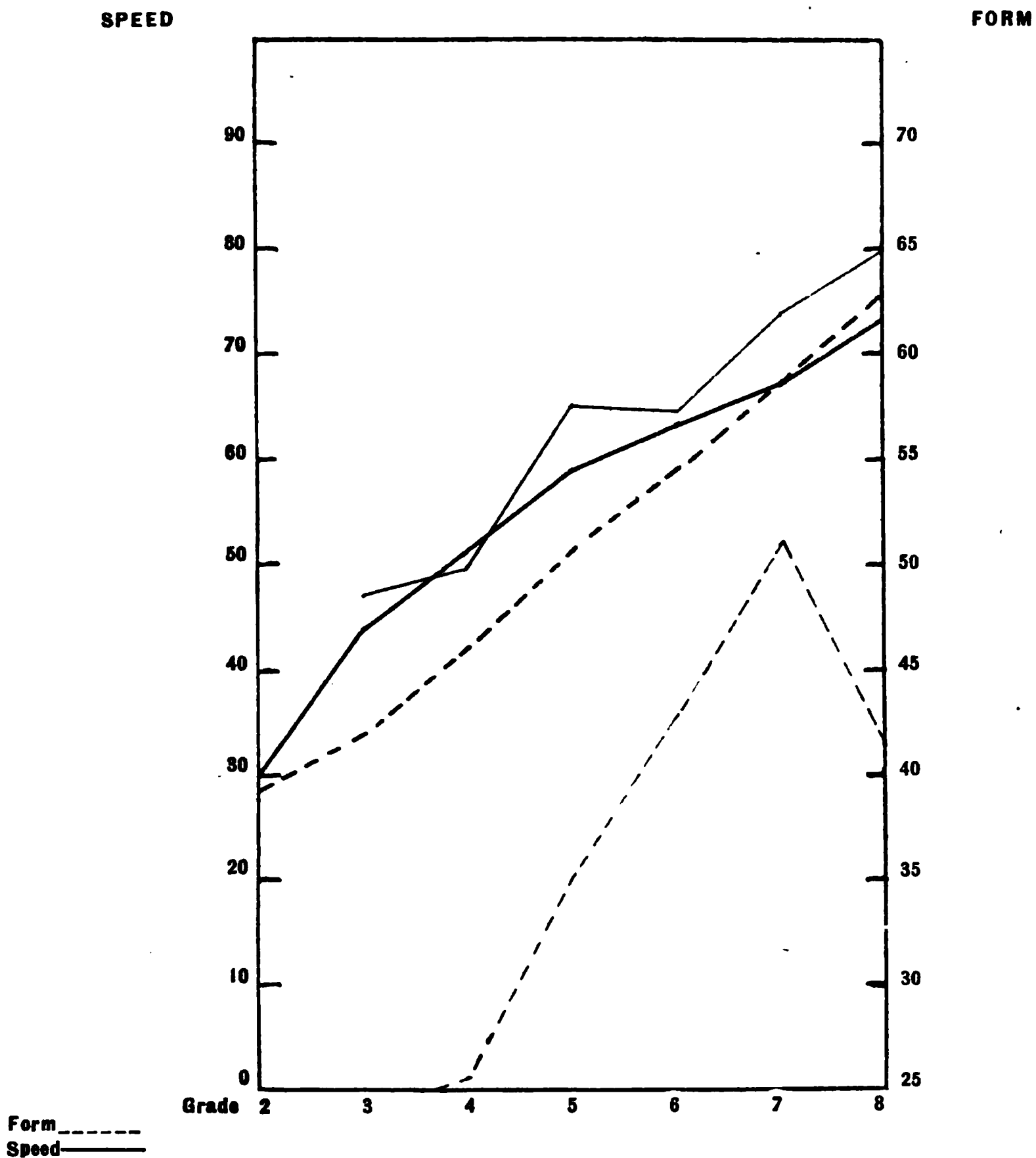
speed is somewhat below. In the Columbine School, on the other hand, the speed is above in all the grades but one, while the form is decidedly below in the eighth grade. In the Vassar School there is a very large deficiency in speed in the upper grades, while form is decidedly above the median for the city, and is practically at the standard. Adequate



supervision based upon supervisory tests should eliminate such large differences as these.

In order to estimate the amounts of deviation in the various schools or grades from the general practice, the number of individual grades which are markedly different from the median has been counted, and it appears that forty-four grades out of two hundred and eighty-two, or 15 per cent, show marked deviations from the general practice. This percentage is rather small, indicating that while certain schools deviate

CHART III—COLUMBINE SCHOOL



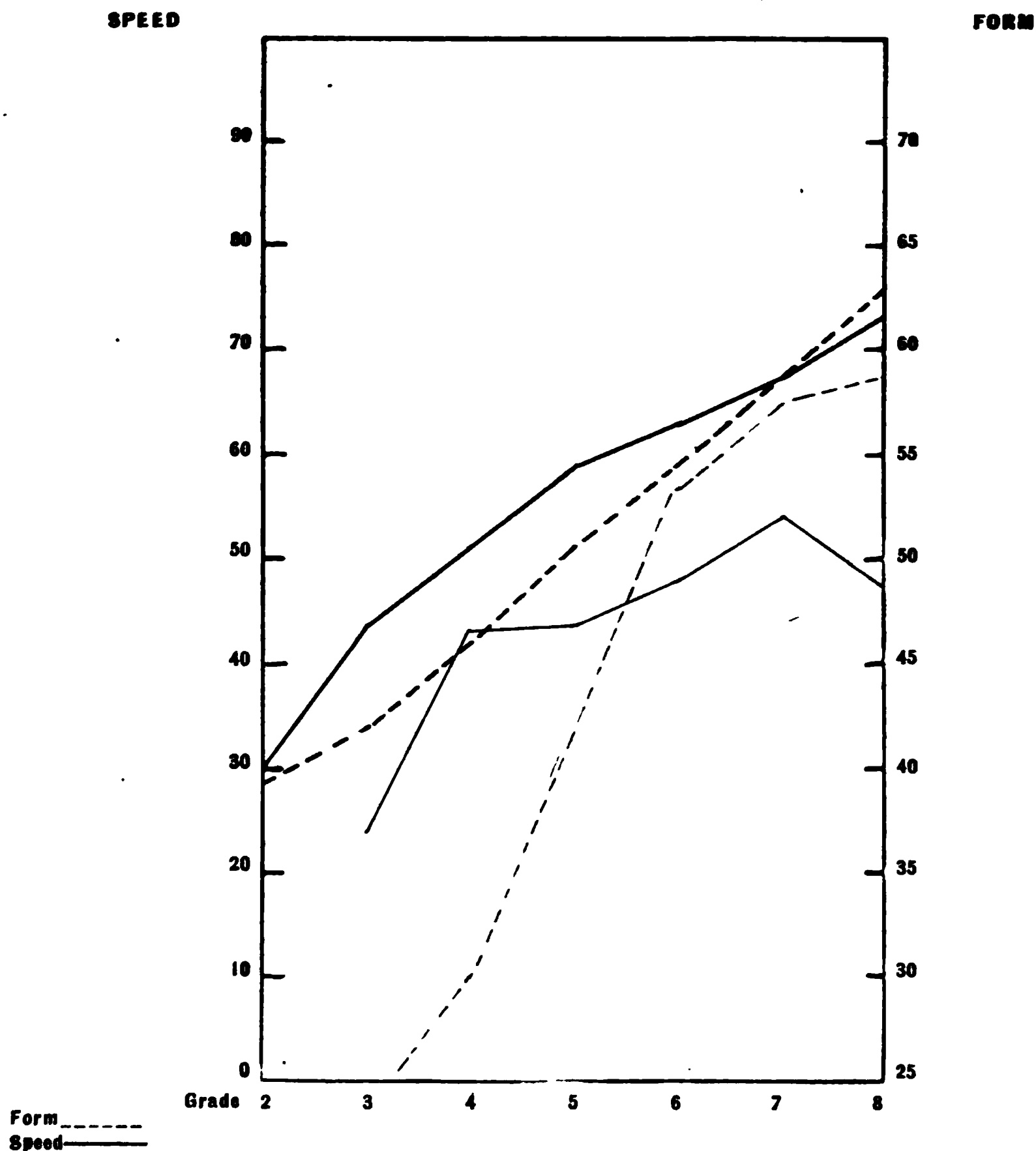
very widely from the general practice, there is on the whole a rather high degree of uniformity.

The results of the survey indicate: first, that there is marked deficiency in the form of writing in the city as a whole; second, that there is a very satisfactory degree of uniformity in most of the schools, but that certain of them deviate much too widely from the general practice; and third, that the deficiency in the results of the teaching is probably to be ascribed not to the particular method of teaching which

has been adopted, although this might be improved in the lower grades, but to the execution of the method, or to the management of the work in the schools.

Fully to appreciate the tables for inspectorial and supervisory purposes the results must be arranged so as to permit a comparison of the work in the different schools. The middle 50 per cent of the schools

CHART IV—VASSAR SCHOOL



show the normal practice for the city. The upper 25 per cent show where the work is progressing best, and the lowest quarter of schools show where difficulties of some sort are being met with, and which require supervisory assistance. Where exceptionally high or low standing is shown, usually a second test, using Ayres' Scale for marking, should be given by way of being sure that the exceptional position is not due to accidental conditions existing at the time of the test.

The following tables show the relative standing of the grades in the different schools; first, in the matter of the *form* of the writing, and then in the matter of *speed*:

TABLE VII

## Form of Handwriting, Ayres' Scale

Grade III		Grade IV		Grade V	
Washington	36	McKinley	43	Vassar	50
Ironton	35	Valverde	42	Evans	48
Mitchell	30	Cheltenham	41	Whittier	47
Clayton	30	Park Hill	40	Valverde	46
24th Street	29	Montclair	39	Park Hill	45
Sheridan	29	Evans	38	Bromwell	45
McKinley	29	Milton	37	Ironton	44
Valverde	28	Webster	36	Webster	43
Evans	28	Ironton	36	Emerson	43
Ashland	28	Myrtle Hill	35	Clayton	43
Webster	27	Logan	35	Boulevard	43
Steele	27	Boulevard	35	Wyman	42
Garfield	27	Wyman	34	Steele	41
Myrtle Hill	26	Ebert	34	Myrtle Hill	41
Logan	26	Ashland	34	Smedley	40
Franklin	26	Washington	33	Cheltenham	40
Corona	26	Sherman	33	Bryant	40
Cheltenham	26	Grant	33	Franklin	39
Central	26	Franklin	33	Corona	39
Byers	26	Smedley	32	Ashland	39
Bromwell	26	Bryant	32	Sheridan	38
Berkeley	26	Gilpin	31	Montclair	38
Bryant	26	Garden Place	31	McKinley	38
Alcott	26	Elmwood	31	Grant	38
Wyman	25	Edison	31	Gilpin	38
Whittier	25	Corona	31	Edison	38
Villa Park	25	Vassar	30	Alcott	36
Swansea	25	Mitchell	30	Logan	36
Smedley	25	Lincoln	30	Garfield	36
Lincoln	25	Bromwell	30	Berkeley	36
Gilpin	25	Berkeley	30	Mitchell	35
Emerson	25	Whittier	29	Columbine	35
Edison	25	Villa Park	29	Milton	34
Vassar	24	24th Street	29	Hyde Park	34
Sherman	24	Hyde Park	28	Garden Place	34
Park Hill	24	Garfield	28	Ebert	34
Milton	24	Emerson	28	Elmwood	33
Hyde Park	24	Clayton	28	Columbian	33
Grant	24	Central	28	Lincoln	32
Gove, Aaron	24	Swansea	27	Gove, Aaron	32
Elmwood	24	Steele	27	Swansea	31
Columbine	24	Gove, Aaron	27	Sherman	31
Boulevard	24	Byers	27	Fairmont	30
Montclair	23	Sheridan	26	Villa Park	29
Garden Place	23	Fairmont	26	24th Street	29
Fairmont	23	Columbine	26	Central	29
Ebert	23	Columbian	25	Byers	29
Columbian	23	Alcott	25		

TABLE VII—(Continued)

Grade VI		Grade VII		Grade VIII	
Ironton .....	64	Montclair .....	70	Cheltenham .....	79
Evans .....	56	Cheltenham .....	70	Sheridan .....	69
Vassar .....	54	Corona .....	65	Gilpin .....	66
Gilpin .....	52	Edison .....	64	Alcott .....	66
Cheltenham .....	52	Lincoln .....	59	Wyman .....	65
Corona .....	51	Grant .....	59	Montclair .....	65
Webster .....	50	Ebert .....	59	Steele .....	64
Wyman .....	49	Vassar .....	58	Logan .....	64
Whittier .....	49	Gilpin .....	58	Evans .....	64
Valverde .....	48	Villa Park .....	57	Valverde .....	63
Steele .....	47	Logan .....	57	Bryant .....	63
Emerson .....	47	Boulevard .....	57	Swansea .....	62
Myrtle Hill .....	46	Washington .....	56	Columbian .....	62
Mitchell .....	46	Steele .....	55	Lincoln .....	60
Ashland .....	46	Fairmont .....	55	Fairmont .....	60
Ebert .....	45	Evans .....	54	Byers .....	60
Bromwell .....	45	Myrtle Hill .....	53	Vassar .....	59
Logan .....	44	Ashland .....	53	Milton .....	59
Edison .....	44	Alcott .....	53	Corona .....	59
Park Hill .....	43	Central .....	52	Boulevard .....	59
Hyde Park .....	43	Bryant .....	52	Grant .....	57
Grant .....	43	Byers .....	52	Emerson .....	57
Fairmont .....	43	Park Hill .....	51	Berkeley .....	57
Elmwood .....	43	Columbine .....	51	24th Street .....	56
Bryant .....	43	Whittier .....	50	Sherman .....	56
Columbine .....	43	Valverde .....	50	Mitchell .....	55
Clayton .....	42	Mitchell .....	50	McKinley .....	55
24th Street .....	41	Wyman .....	49	Ashland .....	55
Franklin .....	41	McKinley .....	49	Whittier .....	54
Montclair .....	40	Emerson .....	49	Smedley .....	54
Lincoln .....	40	Bromwell .....	49	Park Hill .....	54
Alcott .....	40	Smedley .....	46	Myrtle Hill .....	54
Milton .....	39	Sherman .....	46	Central .....	53
Gove, Aaron .....	38	Berkeley .....	46	Franklin .....	52
Villa Park .....	37	Milton .....	45	Clayton .....	52
McKinley .....	37	Garden Place .....	45	Bromwell .....	52
Swansea .....	36	Franklin .....	45	Gove, Aaron .....	50
Sherman .....	36	Sheridan .....	44	Garfield .....	50
Boulevard .....	36	Hyde Park .....	44	Garden Place .....	50
Garfield .....	35	Gove, Aaron .....	44	Ebert .....	49
Garden Place .....	35	Columbian .....	44	Edison .....	48
Central .....	35	Elmwood .....	43	Hyde Park .....	47
Byers .....	35	Clayton .....	43	Elmwood .....	44
Berkeley .....	35	Garfield .....	40	Villa Park .....	43
Smedley .....	34	24th Street .....	38	Columbine .....	42
Columbian .....	34	Swansea .....	34		
Sheridan .....	33				
Washington .....	30				

TABLE VIII

## Speed of Handwriting, Letters Per Minute

Grade III		Grade IV		Grade V	
Columbian	50	Myrtle Hill	63	24th Street	70
Washington	48	Logan	58	Byers	69
Evans	48	Byers	58	Columbian	68
Wyman	47	Garfield	57	Myrtle Hill	67
Columbine	47	Lincoln	56	Columbine	65
Emerson	43	Whittier	55	Hyde Park	65
Fairmont	42	Washington	54	Franklin	64
Cheltenham	42	Montclair	54	Fairmont	61
Whittier	41	Emerson	54	Swansea	60
Sheridan	40	Swansea	53	Lincoln	60
Ironton	39	Garden Place	53	Garfield	60
Lincoln	38	24th Street	52	Garden Place	60
Corona	38	Franklin	52	Bryant	60
Valverde	37	Cheltenham	52	Bromwell	58
Swansea	37	Bromwell	52	Logan	57
Park Hill	37	Grant	51	Valverde	55
Hyde Park	37	Columbian	51	Sheridan	55
Garfield	37	Boulevard	51	Park Hill	55
Edison	37	Villa Park	50	Mitchell	55
Ebert	37	McKinley	50	Evans	55
Boulevard	37	Ironton	50	Emerson	55
Ashland	37	Hyde Park	50	Ebert	55
Myrtle Hill	36	Gilpin	50	Steele	54
Logan	36	Fairmont	50	Montclair	54
Villa Park	35	Columbine	50	Whittier	53
McKinley	35	Bryant	50	McKinley	53
Grant	35	Elmwood	49	Cheltenham	53
Smedley	34	Corona	49	Boulevard	53
Gilpin	34	Wyman	47	Ashland	53
Steele	33	Gove, Aaron	47	Sherman	52
Webster	32	Steele	46	Gove, Aaron	52
Gove, Aaron	32	Sherman	46	Villa Park	51
Berkeley	32	Valverde	45	Elmwood	50
Montclair	31	Central	45	Alcott	50
24th Street	30	Alcott	44	Milton	49
Milton	30	Webster	43	Corona	49
Byers	30	Sheridan	43	Central	48
Bromwell	30	Park Hill	43	Wyman	47
Franklin	29	Milton	43	Smedley	47
Elmwood	29	Evans	43	Gilpin	46
Clayton	29	Edison	43	Grant	45
Alcott	29	Vassar	42	Edison	45
Sherman	28	Smedley	40	Webster	44
Garden Place	28	Berkeley	40	Ironton	43
Central	28	Ashland	37	Vassar	42
Vassar	27	Clayton	34	Berkeley	42
Bryant	25	Mitchell	30	Clayton	36
Mitchell	23	Ebert	29		

TABLE VIII—(Continued)

Grade VI		Grade VII		Grade VIII	
Garden Place .....	76	Lincoln .....	83	Garden Place .....	89
Columbian .....	74	24th Street .....	81	Ebert .....	87
Swansea .....	73	Valverde .....	78	Franklin .....	83
Grant .....	73	Columbian .....	78	Elmwood .....	83
Washington .....	72	Bromwell .....	78	Swansea .....	82
Valverde .....	72	Smedley .....	75	Corona .....	82
Myrtle Hill .....	71	Myrtle Hill .....	75	Garfield .....	80
Whittier .....	70	Elmwood .....	75	Columbine .....	80
Byers .....	70	Swansea .....	73	Steele .....	79
Garfield .....	69	Columbine .....	73	Gilpin .....	79
Ebert .....	68	Garden Place .....	71	Whittier .....	78
Lincoln .....	67	Park Hill .....	70	Valverde .....	78
Hyde Park .....	67	Garfield .....	70	Boulevard .....	78
Elmwood .....	66	Ebert .....	70	Villa Park .....	77
Ashland .....	66	McKinley .....	69	Bromwell .....	76
Sherman .....	65	Sherman .....	68	Byers .....	75
Gilpin .....	65	Byers .....	68	Edison .....	74
24th Street .....	64	Wyman .....	67	Berkeley .....	74
Steele .....	64	Gove, Aaron .....	67	Park Hill .....	72
Corona .....	64	Gilpin .....	66	McKinley .....	72
Bromwell .....	64	Evans .....	66	Fairmont .....	70
Smedley .....	63	Bryant .....	66	Wyman .....	69
Sheridan .....	63	Ashland .....	66	Sheridan .....	69
Columbine .....	63	Washington .....	65	Smedley .....	68
Montclair .....	62	Emerson .....	65	Sherman .....	68
Franklin .....	62	Corona .....	65	Mitchell .....	68
Fairmont .....	62	Boulevard .....	65	Hyde Park .....	68
Edison .....	62	Grant .....	64	Logan .....	67
Boulevard .....	62	Logan .....	63	Columbian .....	66
Cheltenham .....	61	Fairmont .....	63	Ashland .....	66
Bryant .....	61	Edison .....	63	Clayton .....	65
Webster .....	60	Berkeley .....	63	Montclair .....	64
Berkeley .....	60	Milton .....	62	Myrtle Hill .....	63
Mitchell .....	59	Villa Park .....	60	Gove, Aaron .....	63
Alcott .....	59	Alcott .....	60	Evans .....	63
Villa Park .....	58	Whittier .....	59	Central .....	63
Gove, Aaron .....	58	Steele .....	58	24th Street .....	62
Emerson .....	58	Hyde Park .....	58	Lincoln .....	60
Park Hill .....	57	Cheltenham .....	58	Cheltenham .....	60
Logan .....	56	Mitchell .....	57	Bryant .....	59
Central .....	56	Franklin .....	56	Grant .....	56
Evans .....	55	Montclair .....	55	Alcott .....	55
Wyman .....	54	Vassar .....	54	Milton .....	54
Milton .....	52	Sheridan .....	54	Emerson .....	51
McKinley .....	52	Clayton .....	50	Vassar .....	48
Vassar .....	49	Central .....	49		
Ironton .....	48				
Clayton .....	48				



## VIII

## GERMAN IN THE GRADES

The only foreign language taught in the grades is German. It is found as an optional subject in sixth, seventh, and eighth grades in about eight schools. The time given to the subject ranges variously from sixty to one hundred and seventy-five minutes per week, the most usual amount of time being one hundred and twenty minutes. The subject being optional, less than half the pupils take it in the buildings where it is taught. The result is that the classes are small and the subject is therefore two or three times as expensive per pupil as history or geography in the same grades.

The subject is not taught mainly to children of German parentage by way of bridging a social separation that often arises where immigrants of the first generation speak only German and the children are taught only English within the schools. Under such conditions there is a clear justification for developing an appreciation of German literature on the part of the children, but no such condition exists in Denver. This reason for teaching it does not obtain.

If the language is needed for one's professional investigations in one's later professional college course, then it can be obtained for reading purposes with greater economy and greater effectiveness in the high school. After three years of work in the elementary school students find themselves at that point of proficiency attained after one year of work in the high school. The elementary work is accorded just one year of credit upon the high school course. Yet owing to the small classes in the elementary school it is probably costing the city about three times as much to do it in the elementary school as it would cost to do it in the one year in the high school.

There is no sufficient justification for teaching German in the grades. It is expending time, effort, and money for what is in fact only a luxury for the few, and not a real necessity for one child in ten of those who take it, and this at a time when the time, labor, and money are sorely needed for useful things. The very few who must have it upon this level should be permitted to get it as they get their piano lessons. There is no justification for placing the burden upon the general public.

If it must be taught, however, the authorities should decide whether the language is taught for reading purposes only or for both reading and speaking purposes. If the work is for reading proficiency

only, then it will be possible to bring the children from different schools together into centers so that they can be handled in classes of thirty-five or forty. They will then have to be provided with a wholly different type of reading matter from most of that with which they are now supplied, and with a much larger quantity of proper reading matter. The work will also have to be done in different manner from that which is now usual. Further, the burden of the work, the responsibility for doing it well should be thrown definitely upon the pupils in the main, and the parents. If pupil and parent do not want it sufficiently that the major effort can be made by them and not by the teachers, then there is no reason why the general public should pay teachers for forcing the language upon unwilling pupils and unassisting parents.

If, on the other hand, the children need a speaking and writing knowledge of the language, then classes necessarily have to be small and expensive, and the method largely conversational. There has to be a larger quantity of technical grammar, and a larger quantity of drill in application of this technical grammar. It is inconceivable, however, that enough people really need to speak the language to warrant this immeasurably more difficult and more expensive procedure.

## IX

### HISTORY

History in the Denver schools is a seriously neglected subject. It is systematically taught in only the eighth grade. It finds a place on the program of the seventh grade in less than half of the schools of the city; and in these schools it receives a median amount of time of only thirty minutes a week. History is found on the program in the fourth, fifth, and sixth grades in less than half of the schools; and also in these schools it receives a median amount of but thirty minutes a week. Whereas in cities in general more than 6 per cent of the total elementary school recitation time is given to history, in Denver only a little more than 2 per cent of this total elementary time is given to the subject. Even in the one grade in which it is systematically taught, it is given a less proportion of the time than the average of cities in general for this grade. The large neglect of the subject in grades four, five, six, and seven is very unusual.

Forty per cent of the children leave school before the eighth grade. This means that almost half of the citizens of Denver do not receive the necessary training for American citizenship that comes through at least one year's full systematic study of American history. Those who need this type of training most are those who come from homes that have not already the traditions of American citizenship and the general American outlook upon affairs. In other words, it is the children of immigrant families who are in greater need of American history than the children of native American stock. And yet it is these children of immigrant parentage who drop out of school in largest numbers before the eighth grade is reached. It is probable that a majority of immigrant children leave school without having had American history. This should receive immediate attention.

"History teaching in elementary schools should make for good and efficient citizenship," says the course of study. The position is well taken. The greatest single task before American education today is efficient training for citizenship. Of the instruments for this training, none is more important than history. We recommend, therefore, that the subject be effectively used for the purpose and that the amount of time given to it in the fourth, fifth, sixth, and seventh grades be greatly increased.

### The Purposes of Teaching History

School authorities must determine the purposes of teaching the subject before they can know what topics they will have taught, what

kinds of books they must secure for the purpose, what kinds of other helps are needed, the methods that are to be employed in the work, and finally, the amount of time to be given to the subject. The neglect of the subject, the placement of it, and the teaching helps supplied for it, all indicate that the school authorities have not systematically and exhaustively considered their reasons for teaching it. When several dozen teachers were asked as to the purposes that they kept uppermost in consciousness as they taught history, the replies were so diverse as to present confirmatory evidence that the school organization is not clear in its own mind as to the results it is trying to secure. Of the following purposes, all of which were given by Denver teachers, one teacher would mention two or three, and another teacher a different two or three:

1. To inspire a love of country.
2. Appreciation of causality in human affairs.
3. The inspiration of youth through historical contact with great characters.
4. A knowledge of the "difficult facts" of United States history.
5. Oral expression.
6. Practice in reading.
7. Training of the memory.
8. Ability to gather facts upon any topic.
9. To develop or to increase interest in current events.
10. To measure the life of the present in terms of the life of the past.
11. To train for patriotism, courage, self-sacrifice.
12. To reconstruct in the pupil's consciousness the past life of our nation, and to make it seem a living reality.
13. To develop reasoning ability.
14. To train in the power of independent study.
15. To train in the organization of facts.
16. To bring about the learning of a few basic facts concerning American history.
17. The ability to make clear, brief statements.
18. An appreciation of a few great movements in the United States.
19. A realization of the responsibilities of American citizenship.
20. To instill in youth noble ideals of life and duty.
21. To know the things that everybody is supposed to know.
22. Civic inspiration.
23. The formation of reading habits.
24. To reveal the way reforms or social improvements are brought about by practical men.
25. To develop tolerance and open-mindedness.

- 26. A realization that national welfare is chiefly dependent upon the character of the people.
- 27. - A revelation of the common nature of man in all ages of the world, and of the human motives that control in his shaping of his destiny.
- 28. An interest in historical reading.
- 29. A hatred of war and other social wastes.
- 30. A realization of social interdependencies.
- 31. An understanding and an appreciation of the social evolution

t r i b u t i o n o f t h e l i b r a r y	LOCATION		CALL NUMBER	
	VOLUME			
THE UNIVERSITY OF MICHIGAN LIBRARIES	NAME		TITLE	
	ADDRESS		AUTHOR	

ity methods of solving  
ad them without a feel-  
of Denver is immeas-  
usual practice of the  
dy. There is, in fact,  
at is not mentioned by  
nem avenues of expres-  
o be done.

History

red sufficient for laying  
fifth grades. It indi-  
men. No books, how-  
hools to be used in the  
dations of the manual  
ies in the sixth and  
uerber's "Story of the  
's "Story of the Great  
plied to most buildings  
can history, but other  
t been systematically

seven is the following:  
for government, and

develop through constructive work with the pupils the different forms of government." There is no suggestion, however, as to how teachers can teach the necessity for government; what materials they should have the pupils read; the kinds of things that they should themselves present orally; nor the quantity of fact-materials that need to be presented. The demand that teachers "develop through constructive work

with the pupils the different forms of government" probably asks of teachers an impossibility, if indeed it asks anything at all. The words are sufficiently vague, and as one goes from classroom to classroom to see what it means by overseeing what is done, the meaning is not revealed, since the thing is not attempted. The specific things to be done are not set down for the teachers in the manual, nor the books to be read, nor the exercises for the pupils to perform. Attention is called to this statement, since it is typical of a large portion of the printed course of study. One finds the course of study recommending such excellent matters as the following:

1. "Studies in industrial growth, commercial significance, and transportation development."
2. Studies in civics, embracing elementary ideas of government—local, state, and national.
3. Studies in the needs of the home and community, such as water supply, sanitation, mail service, transportation, telegraph, telephone, fire and police service, newspapers, public institutions, etc.

The books are not, however, supplied to the various buildings for the teaching of these things. Specific references are not given to teachers by way of helping them to an understanding of the kinds of things that the authorities have wished taught. No suggestion is made as to the amount of teaching that should be given in each of these several fields. The inevitable result of such a situation is that the things recommended are not taught. It is not a matter of giving the teacher freedom to choose her own details. It results in freedom to omit the thing altogether. Most teachers, therefore, do omit it altogether. Some waste their own and the students' time in random talks about these matters, since they have not the necessary things to work with. A few progressive teachers in buildings supplied with proper books succeed in developing certain of these matters. They do it, however, in the face of serious obstacles, which it is the duty of the overhead management to remove.

## Methods of Teaching

The methods of work in the eighth grade, where the subject is systematically taught, have to be considered in the light of the amount of subject matter to be covered in a very limited time, and in the light of the textbooks that are prescribed for the work. *The facts of a standard text are to be learned in the course of a single year.* Whatever the teacher's ideas as to the purposes of the work, the methods to be employed, the things to be read, etc., practically only one course of procedure is left open to her: she must teach the textbook, have the facts learned, have them reviewed, drilled into the memories of the pupils, and examined upon at the close of the term. This undesirable



method is therefore the usual one. It is not the teachers who bear the major share of the blame, but rather those responsible for the conditions under which the teachers work. Improvements must be brought about first by those who are responsible for courses of study, selection of textbooks, supplementary books, supplies, equipment, the distribution of time, etc., etc.

The following features of good method—in spite of the limitations referred to—were observed in classes here and there in the systematic history work of the eighth grade:

1. In certain of the buildings the class is supplied with a variety of texts. In these schools the basis of the work is usually an outline of topics, and the pupils are enabled to gather the facts from a variety of sources. The method is facilitated by the free textbook plan in use in Denver. Unfortunately the eighth grade classes in the majority of the schools are not so supplied with parallel sets of books for the work. Rarely do they have even sufficient library historical reference books.

2. Where the work is being well done, there is generous use of historical maps. These are in part wall-maps and in part are found in the various works of historical reference. Map drawing in a variety of forms is employed. The best type noted was the use of ready prepared outline maps on which the pupils represent historical developments.

3. In schools where classes have access to a variety of reference books, special topics are assigned to individual pupils for study and class reports. The method not only lends interest to the work, but brings to the discussion a great wealth of detailed information as reported by books that present historical movements from different angles. It permits also excellent oral expression of a type that cannot be surpassed.

4. There is a very general use of topical outlines, resulting in coherency and organization of the work.

While one finds good work very frequently of the types referred to, just as frequently one finds a mechanical traditional memorizing of the textbook facts. Of its kind, this work is often well done, as judged by the ideas of a decade or two ago. As one teacher phrases it: "The pupils are expected to study the text so that they can give back in the recitation the principal thoughts to be found in their study of each of the assigned topics." As an extreme type of the plan, one teacher has worked out and has the pupils employ an elaborate mechanical method of mastering the subject matter in the text. It consists of the following steps: (1) In preparing his lesson previous to the recitation, the pupil reads a paragraph; (2) he then reads the paragraph again and makes a list of "catch phrases" which recall the main facts of the paragraph—the key words and phrases of the paragraph; (3) he then memorizes his list of key words and phrases; (4) With this

memorized list of catch phrases in mind he repeats the thoughts of the paragraph until he has them thoroughly "learned;" (5) In the recitations at the beginning of the year while he is mastering the method, he first recites his list of key words and phrases, and then reproduces the thought of the entire paragraph; (6) Recitation based upon topical outlines, one topic for each paragraph to be recited upon as above indicated; (7) Individual pupils write the subject matter of the different paragraphs upon the blackboard for class criticism; (8) At the close of the recitation the advance lesson for next day is read, discussed, and any difficulties explained.

This plan is a carefully elaborated one, and an effective one—for memorizing the facts of the textbook, for temporary purposes. The method used in Denver is not often so elaborate, but it very frequently looks toward this identical result. It represents, however, a type of work that is superseded in the best schools of Denver and which should not be permitted to continue in any of them. It is too mechanical, too barren. It cannot succeed in making permanent the memories gained by any such process. It does not really aim at those historical results which at present are considered most important—namely, attitudes of mind, sound criteria of social judgment, a sympathetic appreciation of the social influences that have made and are now making our national life, etc. These are matters that grow out of width of historical experience and fullness of historical experience, not out of the mere learning of a brief and relatively barren chronology of 400 pages. History training, to be effective for its basic purposes, must be chiefly imaginative experience, not mere barren fact-learning. The right kind of experience will leave a sufficient skeleton of fact, if it is rightly done, and it will accomplish all of the other important things besides.

### Material Helps

A frequent statement of serious import made by the teachers is: "We have nothing with which to supplement the work of the textbook." On the other hand, in one school, one finds for the upper grade reference work in history, 121 separate titles of books, a number of which are supplied in sets for class use. Between these two extremes one finds an equipment of varying adequacy.

The amount of historical reading materials needed for class and reference work by those schools in which the best work is now done is the amount that is needed by all of the buildings of the city in order to do an equally good quality of work. The enormous differences in the character of the work is in large part due to the differences of library and supplementary book equipment in the different buildings. The efficiency of the work within the city can be doubled by taking care of this single factor alone.

The serious deficiency in reading materials applies to all of the grades, from the third to the eighth. The thing needed is not so much books the facts of which are to be learned, but books which will permit an abundant amount of historical reading-experience. In the grades previous to the seventh this should give to pupils a general over-view of the chronological historical developments, not only in the United States, but also in other countries of the world, both modern and ancient. While it is often objected that children cannot do so much reading, as a matter of fact where the plan is tried the most usual complaint is that they are not able to secure books enough for the work. Where the most is being done the usual testimony is that more still could be done if the books were at their disposal.

Abundant readings that are biographical and concrete and which deal mainly with the simple human element on the level of the children's understanding can thus lay a broad and secure foundation by the end of the sixth grade for the more serious treatment of historical topics in the seventh and later grades. The practical value of history is only recently coming to be appreciated by public education. In this day of complicated civic, industrial, commercial, and other social problems, it is coming to be seen that history furnishes the best method of analyzing the influences and factors involved in each of these various problems. The purpose of history teaching is thus a revelation of the nature of our present-day problems. With a broad foundation laid in the earlier grades it is possible then in the grammar grades to undertake the development of the historical background of civic problems, such as the following: The growth of population, territorial expansion, immigration, relations with our neighbor countries such as Mexico and Canada, the development, organization and control of railroads, the growth of commerce, the growth of manufacturing, the growth of the steel industry, capital and labor, the growth of corporations, their management and control, banks and banking, taxation, labor unions, foreign commerce, agriculture, municipal government, national defense, conservation of natural resources, parks, playgrounds, mining, insurance, child labor, health and sanitation, roads, charities, pensions, postal service, factory labor conditions, etc., etc.

If it is objected that these matters cannot be taught in the grammar grades, it must be replied that we do actually give fragmentary portions of teaching concerning most or all of them. If the historical glimpses of these various problems can be understood as these are met with in the textbook, certainly a full, rounded, systematic treatment of each of them can be at least equally intelligible. It is urged that these topics belong in a college course and not in the grammar grades. In reply it must be said that they are things to be understood by the citizenry within a democracy. They are to be got in the schools to which the citizens go, not in the schools to which they do not go. In

a democracy, whether they take the long course or the short course, they need to have sound understanding of these complicated, social problems. The assumption of democracy is that those who wield the ballot have the power of judgment. Without enlightenment they have not this power, and are not fitted for citizenship. History of the type here referred to must be the chief instrument to be employed in giving them the necessary enlightenment.

The application of this to the topic immediately under discussion is that the schools cannot carry on a virile type of history work until they are supplied with an abundance of historical reading materials adapted to the needs of the different grades, beginning with the third. If it were a matter of memorizing a certain limited body of facts, teachers might give them orally. But when the end is historical experience and the habit of going to historical readings for finding the background of present-day problems, it is simply impossible for teachers to give very much of it orally. They have not and cannot have the detailed wealth of information, and it is not within human power to hold in mind such wealth of details as can be presented in books. Further, it is a highly expensive method to pay teachers to present orally things that pupils can read from books. And it makes pupils dependent upon teachers rather than upon their own independent efforts.

We recommend the purchase of several sets of books of a biographical and historical character for each of the grades, beginning with the third; that a larger number of sets be provided for the upper grades than for the lower, and that each set be purchased in sufficient number as to supply all of the schools after an efficient method of exchange and transfer has been worked out. Six or eight sets of each title ought to supply one grade for the entire city, where the book can be read in a month. Twelve to fifteen sets of each title for a grade will be needed where the reading of a book covers two months. In general, however, where pupils cannot read the book in a month, it is not adapted to the level of their understanding.

When this program of supplying the schools is undertaken, it will be found to be much easier to supply the grades three to six than to supply the seventh and eighth. Suitable readings are not available for these last two grades for the simple reason that the plan of using the textbook and collateral readings has been so universally employed that the demand for anything else has not made itself effective. For the grammar grades, therefore, we recommend that a body of carefully selected reference material designed to supply the reading necessary for the development of such historical topics as we have above enumerated, should be supplied as the permanent historical library of each building. In part, then, the text can form the core of the work, the collateral reading serving to build it out into sufficient volume. In

part the work can be done on the basis of topical outlines not based upon any text, and the readings found in this reference literature. This plan is commonly employed now in our best schools. It is not possible for Denver to adopt it suddenly for the grammar grades because of the fact that the children now in those grades have not had a proper historical foundation laid during the four preceding ones. They are not, therefore, prepared to do the work in the full effective manner in which it ought to be done. It will require several years to bring the work of the grammar grades up to what it ought to be.

While the reading constitutes the most important part of the material helps that are to be supplied, very important also are maps, charts, and pictures. At the present time many of the schools are supplied with certain historical maps and charts. These are not supplied to all of the schools. Many schools have to get along with the geographical maps, which refer only to present conditions, and have practically no maps adapted to the purposes of the history teaching. The school that is now best supplied with maps and charts shows a condition that should certainly be the minimum one for every school within the city. After all schools have been brought up to that minimum it will be found that there is much yet to be done by way of further improving the situation as regards maps and charts.

Mention must be made also as to the desirability of having outline maps for the children's work in history, on which they can record historical developments, movements, expansions, etc. These should be supplied from a central depository. They can be purchased from publishing houses supplying them, but just as serviceable ones could be produced within the city, if that should seem preferable. To supply children with only blank paper for the historical map-drawing is to require tasks so difficult and so long that this necessary map-exercise mostly goes undone. It is important, however, and should be taken care of in ways that can be effective.

### **Difficulties Encountered by Teachers**

As a means of finding out from those doing the work where improvements ought to be made, a large number of the teachers were asked to mention any difficulties that they had met with in the teaching of the history. The method, by the way, is one that we can recommend to the supervisory officials and the board of directors when they are investigating methods of making improvements in the teaching of any subject. The teachers themselves, over and over again, pointed out clearly the things which in the judgment of the writer from his independent observation are the serious obstacles in the conduct of the work. And they pointed to the remedies just as clearly as this can be done in this report. The following are the chief difficulties pointed out by teachers:



1. Repeatedly and insistently teachers said that there was a serious insufficiency of historical reading materials.

2. Throughout the school system teachers say that an insufficient amount of time is allotted for the history work.

3. They refer to the shortage of helps in the way of maps, pictures, charts, source materials, etc.

4. Teachers have not the time to make the necessary preparation for giving the work orally.

5. Leaving all of the systematic history teaching for the eighth grade in so many schools so crowds the time of the eighth grade that they cannot do the work thoroughly and efficiently. The fact that children come to this grade in many schools without any proper foundation having been laid in the early grades makes effective work really impossible.

6. Frequently teachers say that the children do not know how to read so as to gain thought from the printed page of the text. One of the shortcomings of the barren textbook-learning plan of education is that it does not really teach people how to read in proper ways. Only the full reading opportunity of the type demanded by good teachers throughout the system can overcome this difficulty.

7. Teachers say that many of the topics covered, in the history of the national period particularly, cannot be understood by the children. They refer, for example, to paragraphs which deal with the financial history of our country. As a matter of fact the texts give only a few scattered fragments out of the full story of the financial history of the United States. The fault is not with the topic, but in the inadequacy of the treatment in the text. The thing needed is a consecutive, connected, systematic development of this as of the other topics. The remedy has already been sufficiently pointed out.

8. Teachers often refer to indolence on the part of the pupils, and lack of interest. Doubtless there are abnormal minds to which the spirited action of well-written and properly presented history is of no appeal. They probably are rare. This lack of interest and this intellectual indolence, which is, in fact, very frequent, is brought about not by the natural depravity of the pupils, but by the inappropriateness of the intellectual fare that is set before them. Recommendations have already been made which look toward a remedy for this situation.

9. Teachers occasionally mention the fact that the geography of the United States has been so largely forgotten by the time they reach the eighth grade that they are hampered in the historical work. As a matter of fact the teaching of geography in the abstract has but little educational justification and is largely wasted effort. It needs to



be taught in the concrete—as the stage upon which the historical drama is progressing. The place-geography needs to be seen mainly as the setting or the background of human action. Only then can it be seen truly as it is related to human affairs. Only thus can it be appreciated, assimilated and remembered. In recommending a large use of maps of various types in connection with the history, we are thinking of the means of teaching geography just as fully as of the teaching of the history.

## X

## CIVICS

Civics finds no place in the elementary schools except as it is taken care of incidentally in connection with the United States history in the eighth grade. Since there is a wholly inadequate amount of time given to the history work, naturally civics is pretty completely crowded out in the majority of the schools. In a few schools, time is found for some systematic study of the constitution, and of a little analogous study of state and city government. So far as observed, however, the classes are not furnished with sets of textbooks for the study even of the constitution—except, of course, for the textbook in history. The work of the pupils appears to be mainly a reading of the constitution, and a learning of certain of its provisions.

Although a little is being done along this line, it must be said that as a matter of fact the constitution and the general structure of government do not constitute our major civic problems in this country. It is certainly good to have the students have some understanding of the way the constitution grew up, and to know what it is by having read it through carefully. But it is a matter to which not a great deal of time can be profitably given on the grammar grade level. Where the schools are giving a week to the study of the constitution, it is probably sufficient for this topic at this time.

The major problems of training for citizenship, however, are not revealed in even the remotest way in a study of the United States or of the state constitution. They are not approached very closely in a study of the city charter and of the general structure of the municipal government. Our major problems are not those of constitutions, charters, and the general structure of government. The thing needed is a knowledge of the purposes, functions, and methods of government in terms of concrete social needs and relationships. Pupils need mainly to see *how the government is operated* by way of taking care co-operatively of the factors of community welfare, and how the work of officials is or may be *supervised* by the entire body of citizens. The end of the work should relate to that formation of intelligence and forceful public opinion, which alone can produce good government.

Vital civic studies which deal with real civic problems in connection with which the great body of the population needs to be well-informed, must relate to such topics as the following: Public sanitation, the city water supply, street car service, the telephone situation,

fire protection within the city, the street cleaning department, the sewerage system, the smoke nuisance, street paving, street maintenance, street lighting, food inspection, the care of the poor, fire insurance, life and property protection, city parks, city beautification, the child labor situation, hours of labor in different industries, the conditions of labor, wages, interdependence of labor and capital, the care of the defectives, the insane, the delinquent, the criminal, organized charity, taxation, the city budget, city expenditures, community inspectorial functions and modes of effective performance, tenement house regulations, pure food and drug laws, inspection of markets and dairies, inspection of slaughter houses, inspection of cold storage facilities, the work of the board of health, public libraries, municipal and commercial recreation opportunities, banks and banking, savings banks, railroads, newspapers, the postal department, express companies, transfer companies, immigration, our money system, our insular possessions, territorial expansion, growth of population, suffrage, national defense, conservation of our natural resources, pensions, unemployment, cost of living, hospitals, etc., etc.

These and not the constitution represent the real problems with which citizens are confronted. It is in connection with these that an enlightened, forceful public opinion is needed. It is the operation of government in connection with the handling of these various problems that needs to be regulated and supervised by the body of citizens. Some of them should be treated in the elementary school, and all of them in the high school.

Defined in this way, Denver has not yet begun in any systematic way even to discuss the problem of training for citizenship, much less make adequate provision for its accomplishment. The city is made up of a heterogeneous population that has gathered there from all quarters of our country, and also there is an unusually large transitory population that has no thought of remaining permanently, and therefore no permanent abiding interest in the continuing welfare of the city. More than in cities in general, therefore, it seems that citizens who do intend to remain there and who are interested in the continuing prosperity of the city should acquire that civic strength and unity that alone can come from a well-developed and enlightened public opinion relative to the various civic problems.

The city has done well to recognize the importance of and to make provision for training for industrial, commercial, and professional vocations. It is probable, however, that the training for citizenship in a democracy is a more important and a more difficult educational problem than that of training for occupational efficiency. Whether this be the case or not, it is very certain that immeasurably more ought to be done than is now being done. In developing a system of training the educational people will keep in mind that a portion of

the work is to be done in the history class, another portion in the geography class, a third portion in the science class. Certain topics probably, at the present time at least, can best be handled in the arithmetic class, and certain others will be taken care of in a civics class. It matters little what the subject is called, where the topic falls. The main thing is to have a program that is conscious, purposive, and definite, to have time set apart for the work somewhere, to have the necessary readings, and the teachers who are properly informed.

Certain teachers in Denver who are familiar with the nature of the teaching of such civic problems as we have been recommending mentioned that it is difficult to assemble the necessary facts for the teaching of functional civics to children of the eighth grade. This is probably the greatest obstacle in the way at the present moment. There can be no adequate immediate solution. The thing for the schools to do probably is to make choice of a limited number of civic topics, and through co-operative effort on the part of all of the teachers of the subject, and through the assistance of public-spirited organizations within the community, assemble facts from government, state, and municipal bulletins, from reports of various kinds, from the municipal surveys recently made, from books and periodical literature, etc. On very many of these topics it is possible to assemble a sufficient fact-basis for the work. Some of the readings can be obtained for class use; some can be duplicated or printed for the classes.

It cannot be stated too emphatically that for such teaching there must be a well-considered fact-basis. Teachers and pupils must not be permitted to waste time by mere random talk about civic problems. There should, it is true, be much discussion, but the beginning of such discussion should always be an assemblage of facts as to the validity of which there can be no serious question.

The task of assembling the facts cannot be left to the individual teachers working independently. The task is too great. Much can be done, however, by assigning one topic to one teacher to develop, another topic to another teacher, and so on through the list, the supervisory people furnishing the leadership for the co-operative task. The results of all can be pooled and placed in the hands of all teachers. The experience gained in carefully working out a few civic problems will enable the same people later to make an attack upon still more difficult ones.

There is a pretty general realization on the part of teachers throughout the city of the value for this work of "current events." The little paper bearing that title is rather widely used in the city. Newspapers and weekly news journals should be much more widely used for the purpose than is the case at present.

One thoughtful teacher mentions a difficulty of a very serious nature which arises in connection with the teaching of this subject.

She said: "I have never considered it a desirable or necessary part of elementary school work to enter upon a discussion of questions concerning which public opinion is divided."

It is possible to find a divided opinion on the part of different elements of the public in connection with practically every one of the civic topics enumerated. If her judgment is valid, then training for present-day citizenship in our schools is practically impossible. Only those things can be discussed which are either dead or in which the general population has secured its education outside of the public schools sufficient to come to an agreement. It means that the schools must continue to deal only with vague abstractions and generalities, and not get down to actual community problems.

Let the work be based upon an assemblage of facts supported by indisputable evidence; let the discussion grow simply out of an interpretation of those facts; let everything be done with impersonal fairness to all concerned, and the difficulty at least tends to disappear. Some of the topics cannot be taken up at present because the inaccessibility of the facts renders the impersonal method impossible in the immediate present, and therefore the teaching of the topic impossible. Even where the facts are not inaccessible it is often difficult to secure them. These various things make it desirable and perhaps even indispensable that the work have the forceful support and co-operative assistance of public-spirited social organizations in the city who are interested in the development of public enlightenment. In this field, at least, the schools cannot go very far in advance of the community. So long as a community does not believe in enlightenment as the basis of public welfare, and so long as it will not forcefully and consistently lend its support to the teaching of things necessary for public enlightenment, naturally the schools will have to remain impotent.

It is fairly certain that a portion of the training of youth for citizenship in the future must come in connection with the labors and the discussions of adult civic and social organizations. Whereas in the past the one major function of the citizen was thought to be to vote, nowadays we are coming to see that a further major function must be the *supervision* of the labors of his official representatives and agents. For this supervision there will be needed the organization of facts, the presentation of facts, and the discussion of facts concerning the labors of the various social and civic groups and officials. In all probability, as indicated by the development in many cities at the present time, this discussion will take place within civic organizations, which perhaps often or usually meet in the school buildings. Such civic organizations should be made up both of youths and adults. While the youths cannot vote, they can do a great deal by way of gathering facts and performing other detailed labors. Youth is normally educated as he participates in the performance of a part of the entire community function.

along with the adult leaders. As one well-informed Denver teacher put the matter: "It is essential that a child realize his value in a community by helping work out these various civic problems."

Naturally, most of this training must be upon the high school level. Experience in many cities, however, indicates that beginnings of a varied character can be made upon the grammar grade level.



## XI

### GEOGRAPHY

A child who finishes the last grammar grade in the schools of Denver has devoted during his course about 6.5 per cent of his time to class work in geography. The average amount of time devoted to this subject in cities in general is in the neighborhood of 7 per cent. In amount of time, Denver is giving slightly less attention to the subject than the average of the cities of the country. This is by no means true of all schools. The subject receives very diverse emphasis in different buildings. In certain of the buildings it receives less than 5 per cent of the class time; in other buildings it receives more than 8 per cent of the entire elementary school class time. In certain buildings it is a seriously neglected subject; in other buildings it is receiving proper emphasis, though almost everywhere suffering from a great lack of the instrumentalities needed for efficient training.

Looking to the work of the city as a whole, the geography work needs much further development and vitalization. The printed course of study which ought to give clear, full, and sufficient directions for adequate work, is confined to three short pages of vague statements and indefinite suggestions. Only a page and a half are actually devoted to laying out the program of work for the child's entire elementary school career.

The city is investing \$80,000 a year in the teaching of this subject. Where an investment is so large and so continuous, it is presumably sufficiently important as to warrant a most thorough investigation as to what ought to be done, and as to the best means of doing it. The directions for the work should then be set forth fully and adequately. The course of study is of a character that indicates that these careful studies of purposes, means, and methods had not yet been made by the school authorities in the city when the manual was printed, and that as a consequence adequate directions for the work have not been sent out in printed form to the various buildings.

Most of the suggestions of the printed course of study are good so far as they go. The chief objection is that they are so abstract and general as not to be helpful in showing teachers what to do. They do not present stimulating programs of concrete geographical work for the schools.

## The Work of the Third Grade

No textbook is used. Except in only a few instances, supplementary geographical books are not supplied. In practically all cases the work is oral and conversational. The teacher tells the children the geographical matters that they are to learn, or she draws out from the pupils during their discussion the facts which she desires to have discussed. Beyond this not much is done in most schools because they have not the facilities for doing more. During the year they are to learn the cardinal points, to make weather observations, to draw a sketch map or two of the school room or immediate locality, to learn the shape of the earth from seeing the globe, to learn the names of the continents and oceans, to learn to locate Denver and Colorado upon the map of the United States, to discuss conversationally local industries dealing with food, clothing and shelter, and finally to study child life in other lands.

Most of the useful things in this program of work can be accomplished in a very short time. Most of the conversation about the children's observations of the weather and of local industries really add little to what they have gained from their out-of-school experience and observation, and consequently are merely ways of spending school time without accomplishing any sufficiently valuable result. The drawing of the map of the school room or of the neighboring street is profitless. They can learn to read maps just as well without it.

The one thing in this third grade outline that can really be developed into a program of work is "Child Life in Other Lands." It would be better, however, to call this the study of the lives of people in other lands, since it is absurd to try to study child life in isolation from the general life of the country. Child life, whether at home or abroad, is largely an observation of and a participation in the life of the adult world. This is a topic the beginning of which should be developed through readings in this grade; and then continued for fuller readings in later grades. Possible books are: *Around the World*, Books I and II; *The Little Eskimo*; *Earth and Sky*; *Seven Little Sisters*; *Little Folks of Many Lands*; *Children of the Wigwam*; *Little Folks of Other Lands*; *Eskimo Stories*; *Robinson Crusoe*; *Hope the Cliff-dweller*; *Little People of the Snow*; *The Wide World*, etc. The titles mentioned are only to suggest possibilities. Selection should be made from a more extended list.

Stories constitute about the only kind of geography that can be profitable in the third grade, except for a very small portion of the time. Naturally, such readings should be fully illustrated, and as they are read, the regions referred to should be located upon maps and globes. Children best learn to read and to appreciate maps and globes

as they are brought to read the places of things in which they are interested.

Except in a very few instances buildings are not supplied with the readings, the pictures, nor the maps necessary for this type of geographical work in the lower grades. The teachers in general appear to be doing about as much as they can be expected to do with the materials at their disposal—or rather the almost entire lack of materials. The major task confronting the school organization in the development of third grade geography is not mainly a teacher problem. It is a problem for those who are concerned with supplying the schools with the helps needed in the work.

If the geography of the third grade cannot be of this type, it would better be omitted altogether in this grade.

## **The Work of the Fourth and Fifth Grades**

In the fourth grade the first of a two-book series of textbooks is placed in the pupils' hands. From this point four years are devoted in the main to summarizing the facts presented by these introductory and advanced textbooks. In Grade IV, that portion of the introductory book which treats of North America is to be mastered, and during the fifth grade the remaining portion of this book. Two full years of work are laid out in the course of study manual in the brief space of seven lines. It is serious evasion of responsibility on the part of school authorities to give teachers and pupils no more help than this. For a work of such importance there should be scores of pages of suggestions for teachers, showing what may be done in connection with the development of any topic that ought to be developed in these grades, and giving references to books where the materials can be found for the work of both pupils and teachers. Full suggestive outlines of this type need in no degree limit the freedom of teachers in adapting the work to particular needs.

Except in a few cases no geographical readings are supplied the fourth grade. A few specially enterprising schools have been able to secure certain suitable geographical readings. The fifth grade also is in the great majority of buildings practically unsupplied with any suitable geographical material. The teachers often mention a certain well-known geographical reader, but this really is adapted to seventh grade work and is too difficult for that of the fifth grade.

This situation practically determines the methods that can be employed by the teachers. They have the textbooks, but usually nothing else for these grades. Therefore, in the main, the work is simply having the text learned. But the readings of the geographical text are highly unsuitable for the mental diet of children of this age. Much of the material is unassimilable, quickly forgotten unless there

be continuous reviews, and retained only with great difficulty even with the reviews. A thing so learned is completely lacking in vitality. As a result of such methods, it really takes the full two years to master this introductory textbook. It is an expensive method of getting meager results.

The maps and pictures of the text, together with the wall-maps supplied to the buildings, are far more suitable for the work of these grades than is the reading portion of the text. The considerable amount of good results, therefore, comes from the work with the maps and the pictures. The thing needed is, in fact, a continuance or rather an extension of the map and picture work that is being done, but a linking up of this work with an entirely different type of reading matter. The readings needed are those which concretely and interestingly reveal the activities of peoples in different lands, the activities of men engaged in different occupations, etc. In large part this should consist of biographical and historical readings taken care of in another class. In part it will consist of such readings as the following:

- Big and Little People of Other Lands.
- Children of the Cold.
- The World and Its People.
- Little People of Japan.
- Children of the Arctic.
- Little Folks of North America.
- Alice's Visit to the Hawaiian Islands.
- Stories of Industry.
- How the World Is Clothed, Housed, and Fed.
- Industries of Today.
- Around the World, Book III.
- The Great West.
- Stories of Northern Europe.
- People Here and There.
- Little Journeys to Every Land.
- The Earth and Its People.
- Stories of American Life and Adventure.
- The "Little Cousin" Series.
- The "Peeps Into Other Lands" Series, etc.

Our profession is discovering that the basic thing in the earlier geography must be copious geographical readings, with maps and pictures for making the details clear and accurate. The things that we formerly called supplementary we are now making the basis of the work, and the text which once was basic is become a reference-book furnishing maps and pictures and assisting in organization.

The teachers in these grades are very unequally informed as to the things needed for efficient work. Certain of the teachers say that the text

is entirely satisfactory and that nothing else is needed for the work. Others say that the text is unsatisfactory, that the meager geographical readings available are usually unsuitable because of their impossible difficulty, and they enumerate books of travel, of industry, of other peoples, etc., of which the above is a composite list. Between these two extremes one finds the majority of the teachers dissatisfied in small or large degree with the geographical opportunities that are supplied to the pupils, and in greater or less degree able to point out the nature of the difficulty and to ask for the needed remedy. One reads in the larger proportion of instances the need of supervisory assistance by way of putting the work upon the right track. The school authorities, whether professional people or laymen, cannot call the efficiency of the teachers into question until after they themselves have supplied the necessary professional leadership, and have also supplied the necessary teaching helps.

### **The Work of the Sixth and Seventh Grades**

Taking the city as a whole, the geography of the sixth and seventh grades, in outline, methods, and apparent aims, is practically identical with that of the two preceding grades. The chief differences are that they use the advanced text of the series, and that the single series of geographical readers generally supplied to the buildings is not too difficult for the children. Except in the few buildings where teachers and principals have found better ways, apparently of themselves, the work, is for the most part a learning of the textbook, with a moderate amount of supplementation from Carpenter. The work observed in most classes visited was simply a giving back to the teacher in one way or another of facts that had been memorized from the textbook. Only occasionally were pupils found reporting materials from the supplementary readers.

Rather far removed from the ineffective traditional method, in one building the "problem method" was being fairly effectively employed. The teachers appeared to be well-informed as to the method, but the pupils were so inadequately supplied with the necessary reading helps that they seemed not always able to do their portion of the work sufficiently independently. The plan may be used in other buildings, but it was observed in only one. We wish unreservedly to recommend that the plan be fully studied by the principals of the various buildings and that in these later grades it be made the basis of a large portion of the work in all buildings.

The geographical problem can be best approached and organized by developing the subject very largely by topics, using the textbook mainly through these two grades as a book of reference. Take, for example, the topic of sugar. This will divide itself up into the agri-

cultural aspect, the manufacturing aspect, and the commercial or distributive aspect. For the work let the children be supplied with sets of such a book as "The Story of Sugar," from which they can assemble the necessary quantity of specific facts. Let them have outline maps of the United States, or, better, of the world, on which they can record agricultural regions devoted to the production of the raw materials, regions where it is mostly manufactured, trade routes by means of which it is distributed to all the world, etc. The textbook and wall-maps, such as now possessed by the school, will give necessary detailed information for this work. With these facts in hand, let the children discuss the problems relative to the subject. This mode of handling the topic is immeasurably better than the plan found in the usual type of textbook where small fragments of this story are scattered through the entire book, and met with at intervals during the space of two years, with all sorts of other things intervening in the meantime.

The many topics to be taken up in this way are mainly of an economic character, relating to agriculture, manufacturing, mining, commerce, transportation, etc. Some of them will be political, religious, racial, educational, recreational, etc.

For this work in these grades each building will need a permanent geographical reference library containing a considerable number of single volumes for reference. At the same time for taking care of minimum essentials in the subject, it is necessary that there be also supplementary sets of books sufficiently large that each individual pupil can have a book during the period that the topic is being intensively studied. There is no reason, however, why the various topics should be studied in the same order in the different buildings. A plan can be worked out whereby the purchase of a relatively few sets of each title can be made, through a system of exchange, to supply the needs of all of the buildings within the city.

The majority of teachers of these grades say that the reading materials furnished them for the work are satisfactory. Under the circumstances, this in itself is a sufficient indication that the aims are not being sufficiently modernized in the majority of buildings. Again we discover a task of serious magnitude for the principals of the various buildings. In a relatively few cases only are the teachers dissatisfied with the teaching conditions in this subject, and able to present a rational justification for this dissatisfaction. Some of them are in a position to take a portion of the leadership by way of improving the work.

### **Material Helps**

Enough has already been said concerning the reading materials needed. This should constitute the basis of practically all of the geographical work, except for the small amount that can be local and



observational. Many other things are needed, however, by way of supplementing the reading. Of these naturally the most important are maps and pictures. The buildings are at present at least reasonably well supplied with general geographical maps. They are generally deficient, however, in their supply of special maps, such as relief maps, production maps, industrial maps, small outline maps for individual use, large outline maps for class use, etc. These various other types of maps should be supplied.

Pictures are very necessary for showing the details of study. Gathering of pictures from magazines, post cards, advertising literature, etc., makes a valuable exercise for the pupils themselves. Such pictures can be mounted by the pupils and classified on the basis of the topics which they are designed to illustrate. A good deal of this is now being done in certain schools. One of the large virtues of the textbook now in use is that it presents many excellent pictures. In addition to all these, however, it is highly desirable that buildings be supplied with still more adequate possibilities of pictorial representation. The stereoscope is now used in certain buildings, to which it has been supplied in numbers sufficient for class use. For supplying this work, when made general through the city, there is needed a central depository from which the pictures can be obtained when needed and to which they can be returned. Stereopticons and projectoscopes are also occasionally found in the buildings in Denver. These represent a very desirable improvement over those modes of presenting pictures which require individual uses. These instruments permit the placing of a large picture before an entire class, so that the attention of all can be focused upon a picture as it is used for instructional purposes. To secure proper service, however, it will be necessary to have a large supply of pictures for the purpose kept in a central depository to be called for by the schools and then returned. These need to be in sets sufficiently numerous as to provide for at least the average number of calls that are likely to come in at one time.

While a few schools have already begun to supply themselves with these projection materials, it seems that usually they have not yet worked out an adequate technique for the use of them. In general pictures will not be studied as things in themselves and made the starting point of discussion. They will usually be used simply to illustrate the details in the study of larger topics where the picture is necessary for making clear what cannot be adequately described in words. It is one thing to present pictures and talk about them at random, and quite another thing to use them for illustrating the details of a general, well-rounded treatment of some important geographic topic. Pictures should generally be subsidiary and merely for illustrating the details of the larger story which constitutes the primary thing.

In a considerable per cent of the buildings, one finds evidence of the beginnings of a development of the use of what are sometimes called geographical museum materials. These again represent things that in part can be selected, labeled, and arranged by the pupils. A good many of the things, however, cannot easily be obtained by the pupils, nor are the buildings sufficiently supplied with storage space for permanently taking care of so large a collection as is needed for the work in each building. Therefore, the plan frequently referred to previously of using a central depository from which the buildings are supplied will have to be adopted before this can be adequately developed. The city would do well to study the plan employed in St. Louis.

## XII

### ARITHMETIC

Formal work in this subject begins in the second grade. It receives an adequate amount of time. There is greater unanimity of practice in both the time allotment and the character of the work in this subject than in most of the other subjects. The printed course of study in the arithmetic, while it is lacking in helpfulness for teachers and principals, is fairly definite and presents a consistent and well-organized line of work. It is better than most of the other courses because of the fact that the school authorities before drawing it up had a pretty clear knowledge of the specific things that they were after. It shows that where purposes are clearly defined, the work tends to become efficient and effectively organized.

A variety of textbooks are used in different buildings. In the work, however, the teachers appear to adhere fairly closely to the series of topics laid out in the manual, and to omit from the textbooks topics that have been omitted in the manual. In the teaching of the topics often only the materials presented in the textbook are used. In other cases it is heavily supplemented by parallel work from other arithmetics in the hands of the teacher. Sometimes the complicated problems in the regular texts are omitted and easier problems from other books given.

In general the tendency seems to be toward giving a great quantity and variety of practice in simple practical computation. This is indicated by the continual emphasis throughout the course of study upon oral and mental arithmetic. This is very commendable. The tendency in progressive school systems is to give a great wealth and variety of practice for the sake of accuracy, speed, confidence, and facility in the handling of the fundamental operations involving whole numbers, fractions, and percentages.

As this type of work is developed, the common experience met everywhere is that the textbook is inadequate for the purpose, and the work has to be heavily supplemented on the blackboard. One of the Denver teachers reveals the nature of the situation, however, in these words: "I am frank to say that I consider being obliged eternally to supplement the text with problems that have to be placed on the blackboard or dictated, waste of time and energy." As a matter of fact, the time of the teacher is expensive, and it is needed for things more important than mere copying, and what is more, the frequent necessity

of copying the problems on the part of the pupils is not very educative for them. To overcome this difficulty cities are coming to supply arithmetic classes with printed lists of supplementary problems applicable to the various topics and types of arithmetical drill. Examples of helps of this character were occasionally found in the buildings in Denver. They seem, however, to have been obtained by teachers or building principals individually and are not supplied to the schools in general. For the sake of economy and efficiency, the division of supplies should furnish the buildings with needed materials of this character. There are a number of publishing houses supplying such materials, but just as good a supply can be prepared and printed locally if it is so desired.

The printed manual cautions teachers against the use of the recitation period in the indiscriminate explanation of problems. This method of wasting time seems not to be greatly prevalent in the school system. It was met with occasionally, however. It is a feature of method that has lingered over from the old days when the day's arithmetic lesson consisted of only a few very hard problems which only a portion of the class could solve. After such successful effort, the placing of the solution upon the blackboard and reading it to the class was a very natural portion of the triumph. Besides there were the weaker members who were supposed to want to know the secret of how it was done. Now that this type of problem is superseded, now that we are aiming at skill in computation of a practical sort, there is no longer any reason for "explaining problems." Most of that still remaining in the system needs to be weeded out.

Instead of wasting class time in this way, the progressive teachers in the city are devising methods of keeping the pupils actively at work during the entire class period. As a matter of fact, it is only adding, multiplying, finding percentages, etc., etc., that develops skill and speed in computation. For the class to sit idle while somebody talks about what he did accomplishes nothing. The major problem of method is to get everybody to practice the various operations continuously and strenuously during the entire period set apart for the purpose. The best teachers are using various plans by way of stimulating all of the pupils to work actively and continuously. They have them all at the blackboard working at once, or all of them work at their seats, solving the problems on paper, or they have some at the blackboard and some at their seats, but all working on the problems. Problems are given orally, and answers are in unison; or all must solve them in order to give the answers, since children are named at random for the purpose, and each must be ready, whether actually called upon or not. Classes are divided into sides for purposes of competition and the stimulation of greater concentration and strenuousness in the work. Time tests of the Courtis, Thompson, or Studebaker type are given out to the entire

class for simultaneous, individual, competitive effort. The better teachers are pretty successful, it was observed, in keeping pupils active during the period. A large percentage of the teachers, however, are not yet fully clear in their minds as to the justification and necessity for this matter of keeping all of the pupils strenuously active instead of leaving a large portion of them passive most of the class period. In certain schools the efficiency of the work can be greatly increased by taking care of this one thing.

In this connection I wish to call attention again to the possible values of having student committees take care of a portion of the work. When problems are given out on printed sheets for drill purposes of the type that we have recommended, and when they are solved simultaneously in the class in time tests, in group competition or otherwise, really to make the work fully effective all of the papers must be gone over and everything checked up in detail. Carelessness on the part of pupils in the drill cannot be permitted, but it cannot be prevented unless they know that every stroke of their work is to be effectively checked up in one way or another. But when one adds this task to the other things that teachers have to do, the thing is simply impossible. Teachers do as much of it as they can. Conscientious teachers wear their lives out at such work, when as a matter of fact conditions ought to be so arranged that checking the work will be done by those for whom it will be of educational value. The teachers ought only to direct the operations and to check up enough to see that it is really done. A teacher should never do anything which can be turned over to the pupils and at the same time be of educational value to those pupils.

In recommending that a class be divided up into committees of approximately equal arithmetical ability, each committee going over the papers presented by some other committee, the work of checking up the papers is a valuable arithmetical exercise. This is especially the case when pupils must re-solve the problems as they check them up, or make application of some mathematical checking device. The habit of checking up work and the development of a feeling for accuracy are as important educational results as speed and skill in the operations themselves.

At present the greatest waste of time and opportunity comes not in connection with the work intended for drill on the fundamentals, but rather in connection with the solution of the so-called arithmetical reasoning problems. The best work of this type actually seen was in the classroom of a quiet, unassuming teacher who scarcely spoke a word during the thirty minutes of class work. She simply wrote in the beginning two or three problems upon the blackboard, then walked up and down the aisles and observed the success of the pupils in solving them. She continually added to the list by writing more problems

upon the blackboard, and observed their work on their papers at their seats. It was presumably the intention of the teacher to give any help to pupils where they were not themselves able to solve the problems. She rarely gave any such help, however, because it was not necessary. The writer observed the work upon the pupils' papers as it was being done, and was able to observe no mistakes that required the teacher's attention, nor any hesitation on the part of the pupils as to the mode of procedure to be employed. The whole class was making good speed. Naturally, with this mode of procedure, when the teacher takes up a new type of problem, time has to be taken for developing an understanding of it. But it seemed to be her theory of education that one mainly learns to do things by doing them. She could make no mistake by making this the main feature of arithmetical method, even in this field of so-called reasoning problems. The only serious criticism to be made of this type of work as observed relates to the waste of the teacher's time in the copying, which she might have used more profitably if printed helps had been provided.

It is the judgment of the writer that the efficiency of the work with reasoning and analytical problems in most schools could be doubled by attention to methods of getting all of the children to work actively during the entire class period. This type of problem, except as it relates to easy practical operations involving small numbers is tending at present to be a diminishing portion of the work. Textbooks, however, tend to lag behind the best ideas as to practice. Many of the problems given in the texts, therefore, should be omitted because of their complexity and impracticability. Most problems of this type should be of the so-called mental arithmetic type.

Neither inquiry nor observation revealed very much work done in the field of community arithmetic, during the seventh and eighth grades. One class visited, however, was solving problems relative to the rent of apartment houses. They were considering the different prices to be paid for the more and the less desirable flats in buildings, and the annual cost of these different kinds of flats; the monthly rent from the entire building; the annual rent from the entire building; allowances for vacancy, the regular real estate figure being used. They were making calculations as to the cost of heating the flat, the added cost of furnishing hot water, and the lowered rental possible in an apartment house when hot water was not furnished. They were considering the deductions from the total income of the owner that must come from the making of repairs, from the occasional papering and painting. The problem work was full and varied. It related to practical affairs. It gave children an insight into practical situations. They were fully alive and interested, and they had no difficulty in understanding the mathematical relations involved in the problems because they were dealing with concrete things that had actuality in



the region round about them. They were not dealing with abstractions, they were not solving embalmed problems, canned and put up some years before in some distant problem-factory.

This type of community arithmetic is being developed in a number of schools in connection with such topics as taxes, insurance, commercial buying and selling, household accounts, savings, bank account, etc.,

We recommend that the community arithmetic be far more fully developed. There is such a variety of material available that the chief problem is selection: the grocery, the meat market, the department store, cost of heating and lighting the homes, cost of furnishing for the homes, problems relative to saving money, real estate problems, building construction problems, the city gas supply, the milk supply of the city, the city water supply, taxation within the city for the various purposes, cement walks, street cleaning, construction of a boulevard, the street car service, rent, city playground and park service, advertising, city library service, the school fuel supply, janitor service, instruction costs, school supplies and furnishings, etc., etc.

At the present time there is a certain amount of the application of the arithmetic in the school shop, kitchen, and sewing-room. In some cases it is well developed. There are many possibilities, however, that have not yet been discovered. But even after it is developed as fully as it may well be, it will afford a far narrower field for practical application than the various community, civic, and commercial problems. These latter will sometimes be developed within the arithmetic class. Sometimes the arithmetical side of them will be developed in the geography class, not for the sake of correlation, but for the sake of doing the computation where it normally belongs. Very frequently it will be developed in connection with civic problems in the civics class. In a consideration of local civic problems, mathematical accuracy relative to times, amounts, costs, percentages, etc., is just as important as mathematical accuracy in physics, in banking, or in engineering. Mathematical elements will be introduced not for the purpose of any artificial correlation system, but for the sake of doing effectively the work of the civics class, and at the same time of making application of arithmetical knowledge under natural and normal conditions. Geography and history in the later grades developed properly in the way recommended in previous chapters must be economic in considerable degree, and as the economic element is adequately developed, a mathematical element must be introduced. In this way, there is certain in the not greatly distant future to be fairly full application of arithmetical operations. When teachers were asked if they made application of the arithmetic to problems in geography, for example, they frequently answered in the affirmative and mentioned such problems as those relating to longitude and time, calculation of distances between cities by means of the scale of the map, computation of territorial areas,

etc. In general, the problems mentioned are of the type usually developed when teachers try artificially to "correlate" two subjects. Right development of a topic, however, means beginning with the topic itself and developing it so completely and fully that accurate figures are demanded simply as an integral portion of its development. They find their full place even when the work is developed on the principle that nothing is to be introduced but what is absolutely necessary for the development of the topic.

"Where is the time for all of these things to come from?" appalled teachers will be asking; "even the simpler course which we have been using is already so full that we cannot cover it all." The time is to be found in a number of ways: (1) By eliminating quite a number of unserviceable matters; (2) by utilizing time that is now wasted in pupil passivity—the idleness of the class while one is active; (3) by devising methods of pupil activity and furnishing the necessary material helps that will permit the pupils to take over themselves a larger share of the burden, etc.

One of the largest wastes in public education comes from this situation: *The pupils are underworked, and the teachers are overworked.* One of the serious problems before our profession is the formulation of modes of procedure that will greatly increase the burden of actual work of a normal character that is carried by the pupils without, at the same time, increasing the burden that is carried by the teachers.

When such statements are made, the objection is always urged that children, even with their present work, often break down from overwork. Space is too limited for discussion of the question here. We can only say that when children break down during their school career, it is practically always due to unhygienic living conditions at home, unhygienic habits, lack of exercise, physical defects that have not been corrected, injurious physical practices, study under wrong conditions, wrong types of lessons assigned, etc. It is difficult to find well-authenticated cases among normal children of physical breakdown due solely to too much educational activity, where the latter is adapted on the side of quality to the nature and needs of the children. The child who is subnormal in his native vitality should not be placed in the regular classes of the public schools. We are not, therefore, referring to him, but only to the pupils of normal native qualities. Under usual present conditions there is much more likelihood of their breaking down from underwork than from overwork.

### XIII

## NATURE STUDY OR ELEMENTARY SCIENCE

This subject is little valued in the schools of Denver, and is therefore neglected. The course of study manual dismisses the subject with eight lines. While ostensibly recommended, the subject is left entirely optional. As a result, up to a certain point that is not very high, it is handled in the different buildings in all sorts of ways. In a very few buildings, it has a definite place upon the programs of each grade for one period a week. The time allotment ranges from ten minutes to an hour. In other schools the subject is given a definite place on the program by a portion of the teachers and is omitted by a portion of the teachers. In such cases it may be taught chiefly in the lower grades, chiefly in the higher grades, chiefly in the middle grades, or scattered promiscuously through the course. In still other schools something is done with the subject in connection with the language and the geography classes. When merged with these subjects, particularly the language, it sometimes has no great vitality. Very commonly, nothing worth mentioning is done in this field, whether in separate place on the program or in connection with some other study.

Although the present administration is in no wise responsible for the current course of study manual, we must call attention to certain aspects of the manual in connection with this and other subjects because of the fact that new courses of study for all of the subjects need to be made out and printed for the work of the schools. In the course we read: "Since each teacher has her own particular interest in this line of work, it is not considered advisable to present a formal outline, but each principal shall have each teacher prepare a plan of work." Now as a matter of fact, one must search for a long time in the city system before one finds a teacher who has a well-developed "particular line" of nature study interest. In general, teachers were not themselves taught the subject during their own education, and they have not developed it. In general, they have little interest and less knowledge. But even if they had cultivated some particular line, what justification is there for forcing upon all of the children within a given room just that particular kind of science which the teacher happens to have been interested in? No such policy is permitted in the geography, the history, or the arithmetic. Teachers are not left free to develop simply their own particular lines of interest, and teach only what they themselves are interested in.

The subject is either of value or of no value. If of no value, it ought not to be permitted in the public schools at all. The time and the money are needed for things of value. On the other hand, if the subject has real worth in an age of applied science, then it ought to be systematically organized on the basis of the needs of the rising generation, and it ought to be systematically taught. The recommendation above quoted appears to be made out of consideration for the teachers. As a matter of fact, it is supervisory evasion of responsibility. Instead of the overhead management's directing the work and giving full suggestions as to how it may be carried on, the responsibility is handed over to the principals, with the suggestion that they hand it on to the already overburdened teachers. One wonders what the overhead management is supposed to do, when they hand over their responsibilities in this way to the teachers, without attempting even the form of direction or of supervisory assistance to the teachers in the work.

Now as a matter of fact, we live in an age of applied science. Most of the material basis of our present civilization has grown out of an application of science to the problems of production. The operation and right use of the things about us involves a larger knowledge of the science that enters into them. A knowledge of science lies also at the root of our health care, hygiene, sanitation, and physical upbuilding. It is concerned in a large variety of our social problems. Elementary science is probably much more important for the work of the elementary schools than a number of other things which are systematically taken care of in all of the schools. Probably no more time need be given to the subject than is now given in the two or three schools where it is most adequately taken care of. The time, however, should probably be somewhat differently distributed so as to emphasize the subject more heavily in the grammar grades. In the main, however, it is the content of the course that needs to be changed.

At the present time in one school or another, the following topics are being treated:

1. *Plants and Trees*: Leaves, flowers, pea-pods, seed distribution, nuts, cones, fertilization, fruits, life history of certain plants, germination of plants, foliation, preparation for the winter, cellular structure, forms of leaves, adaptation to environment, plant barriers, the trees of Colorado, values of forests, ravages of mildew, smut, rust, etc., yeast, bacteria, detailed studies of such plants as the apple, pecan, peanut, milk weed, chestnut, clematis, squash, catalpa, orange, corn, rice, cotton, sugar beets, etc.

2. *Insects and Other Small Creatures*: Live crickets, spiders, moths, caterpillars, flies, grasshoppers, butterflies, ants, wasps, hornets, cockroaches, water beetles, lady beetles, dragon-flies, cicadas, locust-borers, bees, silk worms, plant lice, snails, slugs, oysters, crayfish.

sponges, etc. A good deal of attention is often given to the anatomical characteristics, wings, number of legs, parts of the body, coloration, peculiarity of eyes, etc. Often a good deal of attention is given to the habits of the insects and their life histories.

3. *Birds*: Parrots, owls, blue herons, sparrows, flickers, etc., through a list of stuffed birds. Attention is given to the migration of birds, their food, their nests, and the nesting habits, coloration, distinguishing marks, anatomical characteristics, life history, economic values, etc.

4. *Animals*: Many wild and domestic animals are studied, one finds as one collects the lists employed in different schools. Studies relate to uses, habitats, habits, anatomical characteristics, protective coloration, defensive weapons and instincts, offensive weapons and instincts, modes of adaptation to environment, animal barriers, the life history of different animals, game animals and game laws, etc.

5. *Geographical Science*: Very frequently the elementary science is but a portion of the geography course, and relates to springs, geysers, artesian wells, rock formation, soils, fossils, coal, coral, volcanoes, earthquakes, fresh and salt water bodies, monsoons, weather observations and weather records, clouds, rainfall, snow, frost, dew, winds, ocean currents, tides, etc., etc.

6. *Elementary Astronomy*: In one or two cases children are taught the names and the location of a few major constellations, the names and present characteristics of the planets and their satellites, etc.

7. *Physical and Chemical Science*: A little experimental work is occasionally though rarely done in connection with evaporation, the condensation of moisture, the theory of the thermometer, pendulum, barometer, air pumps, mariner's compass and magnet. Capillarity is treated fairly fully in a few schools. The topic of sound is pretty fully developed also in just a few schools. Two schools, for example, report their studies of the nature of sound, the difference between musical and non-musical sounds, media for the transmission of sound, rates of transmission, reflection, pitch, loudness, the theory of the megaphone, the phonograph, of musical instruments in general, of vocal organs, of the ear, etc.

It is significant of the rudimentary state of development of this aspect of elementary science that except for the magnet, nothing was anywhere discovered that related to the study of electricity, nor of the mechanics of practical machinery of any type. The lack of reference to matters of elementary chemical and physical science in connection with the training of the girls for the household occupations is probably due to the fact that this training is taken care of by special departments that are expected to take care of the science in their work.

8. *Minerals*: A very little is being done in the study of rocks, crystals, ores, etc. In a mining state with mines of a richly varied



character, one would expect to find this very much more fully developed.

The technique of teaching method in this field has been worked out with all degrees of adequacy—or rather more often inadequacy. The commonest method is simply random talks about the things by pupils and teacher. As one teacher phrases it: "We have no method at all; we simply seize whatever opportunity offers." While there should always be sufficient opportunity for spontaneity and adaptation, this plan simply will not do as a program for our expensive and responsible public education. While the usual conversational lesson on the nature study topics may be pleasant enough for pupils and teachers, more often than not the exercise really has added nothing worth while to the pupils' appreciations or knowledge.

In other cases after having taken great trouble in gathering together specimens from the museum or elsewhere of birds, minerals, leaves, seeds, or other things, the teacher was letting the work degenerate into a profitless type of object study. In the study of birds, for example, with a variety of specimens on the table, the purpose ostensibly was to make the children more interested and better informed concerning the living bird life of the outer world. But as the teacher explained to them the size of the bird, the colors, the shape, the length and shape of the bill and toes, explained the feeding habits, the song, the bird's home, etc., all that 90 per cent of the children seemed to be seeing was simply a more or less musty stuffed bird in the teacher's hands. The specimen was not being used for the mere purpose of illustrating a detail out of some larger and well-conceived study of actual outdoor bird life, as for example, the economic values of birds. Instead of the stuffed specimen being illustrative, it was the center, the starting point, and the conclusion of the study. The teacher meant well, and she was conscientiously spending her vitality in going out of her way to secure the specimens for the work. And yet where the work degenerates into mere object study, it is of little or no value. The children would better be out at play. One teacher possessed of great discrimination said: "Methods are generally poor because no special results are expected." The cavalier manner of dismissing the subject in the course of study does not stimulate the discovery and use of responsible methods.

Where superior methods of work were found in this field, it seemed that they usually had been transferred from the geography, or the work was actually being done in the geography class. In one class visited, for example, the plant topic of corn was being developed. For the purpose of exhibiting the various details they had all of the parts of the corn plant, together with a full set of museum materials exhibiting corn products. The pupils had an outline before them which gave references for the study of different sub-topics, and they had made



careful preparation. One boy had prepared on the agricultural aspects of corn. He advanced to the front of the room and told the whole story in connected fashion to the class. A second boy then took his place and explained the nature, the mode of production, the uses, etc., of corn-starch. A third pupil took the topic of the nature and the uses made of the pith of the corn stalk. A fourth discussed corn oil; a fifth, corn syrup; and so on through the list of corn products. Still another pupil discussed the botanical aspects of the corn, mentioning its relationships in the botanical field, the nature of corn in the wild state, the varieties of cultivated corn, etc. The work was excellent in plan. It was chiefly dependent upon the varied readings necessary for giving it body and for developing world outlook, and also upon the presence of the specimen for concreteness of illustration of the various details. In this type of recitation the central thing was not mere object study of the specimen. Central in the consciousness of the children was a general world situation, developed chiefly in the reading. The museum material, while important, was merely illustrative of details. Naturally, there was also the well-informed teacher who knew how to organize the teaching of the topic, but a well-informed teacher without the appliances needed for doing the work is about as helpless as a well-trained machinist without any tools.

Good method is dependent upon these two things, among others: an experiential contact with things for the sake of concreteness of understanding, and reading concerning those things for the sake of giving fullness and width of understanding. In general, the reading will furnish the basis of the organization of any topics, while the concrete experience of laboratory, examination of museum materials, excursions, field trips, etc., will be employed for filling in a solid body of details and for giving the basis of understanding of the reading. It is for this reason that the work is likely to be inchoate, fragmentary, and relatively purposeless where the buildings are not supplied with the readings necessary for assistance in organization. On the other hand, given the reading without the experiential contact, it is vague and unreal.

Certain of the buildings have quite a number of good elementary science library books adapted for the work. Other buildings have few books of this character. A number of buildings have none. The thing needed for good work in the buildings that are best supplied is the thing that is needed for all of the buildings for doing an equally good quality of work. If the work is not worth the doing in the buildings where it is best done, it should not be done in any of them. If, on the other hand, it is worth doing in those buildings where it is best done, then it is worth doing equally well in all of the buildings of the city. The elementary science library situation is seriously in need of atten-

tion. The buildings now best equipped are in a position to take the leadership in developing the matter in all of the other buildings.

It is not enough, however, to have simply the single-volume library books. As one teacher expresses it: "We are in dire need of sets of nature study books, simple enough to be placed in the hands of the children." In connection with every major topic treated there should, it would appear, be a certain central core of reading material that is to be covered simultaneously by all of the members of the class. The reference reading in the library books by different pupils can be employed for building out the fund of information to still wider proportions. But without a large common ground of understanding on the part of the entire class, it is difficult to give substantial organization to the various reference readings.

On the side of actual experience, the schools will naturally try to bring the pupils into sufficiently full contact with most or all of the various realities enumerated in the preceding list of topics now taught in the city. In addition, pupils need to be brought into experiential contact with many things besides, which apparently are not now studied; as for example, to enumerate just a few: electric lights, telephone, telegraph, electric bells, electric batteries, gas engines, the school heating and ventilation plant, the refrigerator, the care of the milk supply, the sanitary aspects of the city water supply, etc., etc. The practical things and situations with which children are concerned in their daily round of existence will take care of a large part of the necessary experience; so that at school not very much time need be taken by way of building it out. In the case of other things, the school will have to introduce a good deal of laboratory opportunity. The major purpose on this level is *experience*, and therefore there should be no great attempt to systematize the work unduly.

In addition to the present use of museum materials, field observations, school garden work, etc., there is needed in all buildings a greater laboratory opportunity. We do not have reference to such systematic work as found in the high school laboratories, nor to the expensive apparatus of the type that is there used. To study electricity, for example, the children will need only certain simple relatively inexpensive electrical appliances like cells, wiring materials, electric bells, electric light globes, toy motors, etc. A good many of the things can be brought in by the pupils, and others can be made in their manual training hour. In a laboratory study of fermentation, sterilization, pasteurization, etc., pupils will need only such containing vessels and chemical thermometers as can be borrowed from the domestic science room. In studying atmospheric precipitation, one needs only a glass or metal vessel of water, and a bit of ice. Resourceful special teachers who know science can bring pupils into contact with a large variety of scientific phenomena without elaborate apparatus. Naturally, there

are certain inexpensive pieces of apparatus that will have to be purchased, and a good many kinds of inexpensive supplies before the work can be well done.

Very many of the science situations will be met with in the shop, kitchen, and school and home garden work. Some of such science on the concrete side will be observational only. Other portions will be taken up for laboratory elucidation and analysis. This work cannot be exhaustive or quantitative on the grammar grade level. The purpose is chiefly to bring children into observant and thoughtful contact with scientific realities, so as to develop a familiarity with these realities. If then they do not go on to high school, they will have some acquaintance with things with which they will have to deal all of their lives. If they go on to high school, a certain foundational understanding will have been laid for later more exact and intensive work.

One Denver teacher said: "Everything which the children bring to me—and their name is legion—receives either immediate attention, or is later talked over in class." This is an excellent feature of method commonly employed in the city. Whether it turns out to be good or bad, however, depends altogether upon the way the thing thus brought in is worked out. If it is but mere random discussion of the obvious, without organization, plan or objective, it results simply in an opportunity gone astray. If it is made the starting point for an expansion of the intellectual horizon, it serves as an opportunity for basing good work squarely upon reality.

On the side of the necessary material equipment for the work, a number of the schools are making systematic efforts for supplying their needs. The work appears to be mostly of an individual character. There is certainly little evidence of encouragement or of material assistance in promoting the work on the part of the board of directors. A larger number of buildings are making only a moderate effort to supply their needs. Another group of buildings is making no appreciable effort. If the work ought to be done, it ought to receive the necessary degree of encouragement and assistance from the overhead management. If it is not the thing which the directors wish encouraged, then they should not permit the work to be done at all. It is possible that occasional wrong decisions on the part of the board of directors as to general policies to be employed would be better than the general and chronic chaos that results from just letting things run, without policies or decisions. The people's money is being invested in this as in other subjects. There should be definite decision as to policies, and adherence to policies in connection with the work of all of the buildings of the city. The present situation is not evidence of management.

Under present conditions the work will be best done in the later grades by departmentalizing it and placing it in the hands of specially prepared teachers.

## XIV

## HYGIENE

The course of study recommends the teaching of this subject throughout all of the grades, beginning with the first. During the first three grades it is entirely oral and usually incidental. Beginning with the fourth grade a good five-book hygiene reading series is prescribed, one book to be read in each grade. For the reading of the prescribed books a period of from ten minutes to one hour per week is set aside in the various schools for the purpose. The usual amount of time per week is twenty-five or thirty minutes. Sometimes a period is definitely set apart on the program for the work. Sometimes it constitutes one of the weekly supplementary reading lessons. The latter practice is common and just because of the fact that it is classified as a reading lesson in such cases, the thought side of it sometimes tends not to be taken sufficiently seriously. It is then often only a matter of sight reading with insufficient attention to other purposes. As one teacher describes her own work: "The subject has only been taught as a supplementary reading lesson. Nothing practical has been taught or any application made."

This subject is one that requires a complicated technique. Several people need to be concerned in taking care of different aspects of the training: the grade, teacher, the school nurse, the school physician, the parents, and the child himself. Certain of the teaching needs to relate to general hygienic information without any specific reference to application, by way of laying a foundation; other teaching must relate to application very definitely, and much of it be, therefore, very different for different pupils, and for the children in different portions of the city. There is then the problem of seeing that the application is made by the children in the varying ways in which it needs to be made. There is also the complicated problem of motivation. Children in general are not introspective—they ought not to be—and the healthier they are, the more difficult it is to get them to take any real interest in the subject. The problem is largely how to give it significance through treating it from an objective and social point of view with the expectation of making personal application through the social route.

An examination of the work seemed to indicate that there had been no systematic and adequate examination of the factors involved in the training on the part of the school authorities, nor any adequate realiza-

tion of the complexities of the problem of technique. This is one of the seriously neglected subjects—except for the one aspect of the general preliminary hygienic reading.

The reading course in the subject prescribed at present is commendable. It can be improved by the inclusion, or in part substitution, of certain readings that are more applicable to conditions in Denver and Colorado. For the work of each grade enough books need to be supplied that all of the pupils in a class can have a copy. In certain classes visited there was only one copy to each two pupils. There is also further need for pictorial and graphic charts, together with certain models and hygienic appliances for demonstration purposes. It must be remembered that this is a field of science teaching. In the chapter on that subject we emphasized the value of reading, but referred to the necessity at the same time of children's being thoroughly familiar with the concrete things to which the reading refers. The pictures in the book are valuable, but further supplementations of the type here mentioned are necessary. This general work will be taken care of by the grade teachers.

But this is not enough. This is only for the purpose of laying a preliminary foundation, much the same for all, on the basis of which special teaching for purposes of application and habit-formation, needed by the physical condition of different children, will be given to those children according to their needs, and only such as they really need. This must be taken care of mainly by the school physicians and the school nurses. Naturally, with the present corps of one school physician, one school dentist, and one assistant to the dentist, the program cannot be developed. As the medical supervision staff is developed, however, the teachings individually needed may be given by physicians or nurses, partly through talks to classes, but in larger degree in connection with their health supervision of the child's activities, both in school and home. They will keep the necessary information alive in the minds of the children and will easily drive it home because of the authoritative position of their profession. Their once saying a thing will count for more than the teacher's saying it a dozen times. Just as we are coming to demand that vocational teaching shall be given by people who are practical specialists in the several fields, so we are coming to feel that the responsible instruction in the later stages and in part all along the line, in hygiene and sanitation, should be given by those who are felt to be thorough and practical specialists in the field. The teaching here should have the sanction of medical authority. In the preliminary teaching the teachers can lay the necessary broad and secure foundations for the work. Then physicians and school nurses can build with effectiveness.

The valuations which Denver teachers place upon training in this field are very different. Some of them say that since the subject is so

much more important than certain other subjects in the curriculum it should be given more time than these other subjects instead of less, and it should have the right of way when anything must go by the board, instead of being the subject that is often neglected. Other teachers, in quite the reverse way, say that because of the fact that the subject is so profitless, it could well be replaced and the time given to others that are of so much greater value. Where a subject is not valued, it will not be well taught. It is very clear that a goodly portion of the teachers are in need of professional leadership and the development of professional valuations.

Until such time as the staff of physicians and nurses is sufficiently large that they can perform their share of the work, a portion of their responsibility, at least, must be borne by the teachers. Quite a number of the latter were asked what they did by way of securing practical application of hygienic information at school and at home by way of developing good hygienic habits, and indirectly promoting a sound physique. All sorts of replies were received. The degree of effort made by teachers ranges from zero, on the one hand, to serious, conscientious, time-consuming "follow-up" work by teachers into the homes of the children. This latter type is very exceptional. Many teachers, however, frankly said that they gave no thought whatever to practical application and made no attempt to secure such. One teacher, rather surprised at the question, said: "I have never heard the matter mentioned." This, of course, is to imply that the educational authorities had not yet taken up anything more than the preliminary aspects of the training in this subject in any systematic and effective way. There is a long program just ahead by way of taking care of the other factors.



## XV

## PHYSICAL EDUCATION

There are two parallel systems of physical training in Denver, wholly independent of each other, at the head of each of which is an independent supervisor. On the one hand, there is a system of calisthenics and other formal gymnastics carried on regularly during the regular school hours as a part of the program for all of the children and supervised by the Supervisor of Physical Education. On the other hand, there is the more recently developed and in all respects the more modern and more vital outdoor playground activity carried on at more than half of the schools, before school, at noon, and after school, which is supervised by the Supervisor of Playgrounds.

To the formal gymnastics, taking schools in general, about fifty minutes per week of the regular program time is assigned. This is ten minutes a day, although sometimes periods are longer and fewer per week. The supervised playground work is usually given about two hours per day—a half hour before school in the morning, a half hour at noon previous to the beginning of the session, and one hour after school. The time at different schools varies, however, from one-half hour to two hours and a half.

The formal gymnastics has been recognized by the educational authorities as a necessary ingredient of public education. It has therefore been made obligatory upon all normal pupils of all of the grades from the first to the eighth. It finds a place upon the regular program. It is paid for out of the regular salaries of the regular teachers. On the other hand, the active outdoor playground activity has not been recognized by the educational authorities as being a necessary ingredient of public education. It is not provided for during the regular hours of the school, and does not therefore find a place upon the regular program. It is entirely optional with the pupils whether they partake or not. On the financial side, it is not maintained by the regular instructional appropriation for the regular teachers' salaries. It is supported by a special fund, half of which is supplied by the school board and the other half by the city park board.

Sixty-eight teachers of the city answered the question: "What type of physical exercise has seemed to you to have been most beneficial to the pupils of your class?" Of these teachers, forty-eight were of the opinion that the formal gymnastics was the more beneficial; twenty

judged the active, spontaneous plays and games, especially when outdoors, to be the most beneficial. When they were asked as to which the children preferred, they were practically unanimous in saying that the children preferred the plays and games. The teachers in voting by a heavy majority in favor of the formal gymnastics and against the preferences of the children practically said that in their judgment the instincts of the children, placed there by nature, are wrong; that the children's appetites in the matter of physical exercise are unsafe guides, and that a thing which is so foreign to human nature that children never indulge it in their free spontaneous play is the thing that is actually needed for a proper development of that human nature. As a matter of fact, all of the presumptions until the contrary is proven are in favor of the judgment of the minority of the teachers, who favor vigorous outdoor play as the thing that is most beneficial in the physical development of normal children. It is the judgment of the writer that the majority of the teachers have not yet sufficiently studied the situation, or they have studied it with a special bias, represented by the special premodern system now in use in the schools.

It must be kept in mind that in discussing either the formal gymnastics of the freer plays, games, rhythmic exercises, folk dances, etc., we have in mind the normal physical development of normal children. In the elaborate physical training manual we find this statement: "The exercises are adapted to the physical needs of the pupil, *i. e.*, of the normal child; physically defective children must be treated separately and orthopedically."

For normal children the writer of this report is able to discern in the formal posturing of the calisthenics only one value that is sufficient to justify any place upon the school program. There is clearly validity in the argument that after forty-five minutes or an hour of concentrated sedentary mental work, it affords a certain relief, a certain lowering of nervous tensions, etc. While five minutes of vigorous calisthenics in a classroom with all of the windows open is certainly good for the purpose, yet it can be said without hesitation that the same amount of time devoted to running around the block, winter or summer, would be worth immeasurably more for the same purpose. The run would be more nearly normal to the instincts and propensities of childhood. It would possess a social aspect and a quality of spontaneity lacking in the calisthenics. It would be vigorous, and it could not possibly be otherwise on account of slackness of performance on the part of the pupils. They would return with flushed faces, with deep breathing, with a circulation in a vigorous process of irrigation of the tissues. There would have been real relief from the concentration upon their books, and something beside.

Now with this compare the formal calisthenics. Every movement is done at word of command. To quote the printed manual: "Strict

attention . . . . is very essential." "The commands must be given in a commanding spirit, with expression of voice such as to convince pupils that they must obey and move promptly." "The quality and the value of an exercise depends almost entirely on its execution at the command. A command is the signal to perform and must clearly indicate that we expect accuracy and promptness. The command of attention is to be given in a loud and clear voice; the command of explanation in a distinctive and explanatory way; the command of execution in a sharp concise manner."

In other words, this exercise is not intended to afford relief from concentrated attention. Quite the reverse, insistence everywhere is that attention be absolute; and what is more, the results are not exercise, but only formal posturings; and that generally of a more or less perfunctory and lifeless character. Note the phraseology of the printed manual: "It should be work in the garments of quiet pleasure and tranquil delight." When pupils are to be given relief from mental tensions, the negative things of quietude and tranquility are not the things that can be most effective. The thing needed is something that will permit a vigorous expansion or even explosion of pent-up muscular energies, and that irrigation of the tissues which can be brought about only through vigorous circulation, and the deep breathing that results from vigorous muscular effort. But spontaneous outbursts of activity are the last things desired in the formal gymnastics. Listen again to the printed manual: "Pupils should stand still during position and while exercising. Laughing, smiling, whispering, . . . . are acts and motions not favorable to good work." Standing still and going through their posturings with the faces of wooden men as a means of physical education of a type of children whose play cannot possibly be normal without laughing, shouting, screaming, running about as spontaneous whim impels, reads like an educational fantasy instead of being an actually prescribed system of training set forth in a manual printed in the second decade of the twentieth century.

The plan has grown up because it is cheap. It requires no indoor space beyond that of the classroom. It can be managed without expensive outdoor play-fields. Most of it requires no equipment. The little equipment required for a portion of it consists of inexpensive wands, dumb-bells, and Indian clubs. The activities are of a sort that makes it easy for the classroom teacher to take the leadership. The system grew up in an age when it was felt that all educational matters must be taken care of inside of regular classrooms. Further, as may be observed by reading the introductory pages of the printed manual, it is supported by an educational theory of pleasing simplicity. There are just so many muscles that need to be exercised. The problem is to devise a series of exercises that will reach all of them; then to set aside ten minutes a day on the program for a formal contraction and relaxa-

tion of those muscles—and behold, the work is done. Since all children are built of the same muscles, the identical system of exercises for the identical length of time is just the thing that is needed by all of these identical children. On the basis of such a medieval theory, Denver gravely spends \$40,000 a year in getting her children developed physically. This is certainly economical in both time and money. The city would do well, however, to study the whole matter to see if it is not mainly but a pretence of physical development.

In the upper grades of the majority of the schools, not much is done during the regular school day outside of the formal gymnastics. The manual shows, however, the beginnings of a recognition of the necessity of something more vital. A few gymnastic games and a little gymnastic dancing is recommended for each of the grades. In most buildings the recommendations are ineffective for the upper grades, but taking effect much more largely in the primary grades. These lower grades, in a good many buildings, have gone very much beyond the recommendations of the manual and have introduced a great variety of excellent games. As it was stated by one teacher: "Formal gymnastics in my first and second grade classes are given as little time as will satisfy the demands of a very considerate supervisor." In the upper grades, also in a few buildings, outdoor games, gymnastic games, folk dancing, etc., are coming to supplant the formal gymnastics in a few schools that are so fortunate as to have the necessary material opportunities and also vigorous, well-trained play leaders who are aggressively assuming the leadership.

The method of managing the supervised playground activities under the direction of the playground supervisor is favorable for bringing about the complete transformation in the physical training of the more conservative schools. The teachers—one or two at each school—who are regularly employed for extra time in supervising the plays upon the school grounds before and after the sessions are given special training in the theory and practice of the most modern types of plays, games, rhythmic exercises, gymnastic dances, folk dances, etc., by the Supervisor of Playgrounds. Throughout the year they are given a regular course in which they themselves learn a great variety of games, folk dances, etc. As the training class under the playground supervisor continues year after year, the repertory of games and dances steadily increases and the teachers are becoming more and more proficient leaders in the physical training of the various buildings. This is providing in nearly all of the buildings the possibility of trained leadership for a modern type of physical development.

It is sufficiently evident that this work needs to be departmentalized and the whole of it for each building placed in the hands of these

specially trained teachers. They will devote the whole of their day to physical training in the same way that other teachers devote their whole day to manual training, or domestic science training. The climate of Denver is such that they can have classes upon the outdoor playgrounds most of the days of the year. For certain days in the year and for a good deal of the rhythmic training and folk dancing, they will have to use the indoor gymnasium facilities. There is just as much reason, probably more reason, for setting aside a suitable room within every building of the city for the physical training as there is for the manual or domestic science training.

As to a positive program on the side of the exercises to be covered, there is no need of our making recommendations. Work was observed in a few buildings which shows the presence of well-informed teachers. An examination of the program of work as laid out by the Supervisor of Playgrounds reveals a full understanding of the needs of the situation, and a thoroughly modern type of training of the play-leaders.

Certain recommendations, however, are needed. Careful observation was made as to the obstacles in the way of effective physical training, and inquiries were made of more than a hundred teachers as to the difficulties met with in their practical experience. While a surprisingly large number of the teachers say that they meet with no difficulties and that the work is proceeding in a perfectly satisfactory manner, yet a still larger number mentioned, and observation confirms, such obstacles as the following: (1) Lack of time; (2) lack of outdoor play space; (3) lack of indoor play space; (4) lack of needed equipment; (5) lack of a specially trained teacher; (6) no provision for music in connection with the rhythmic games; (7) insufficient emphasis upon spontaneous games; (8) the attempt to train boys and girls together in the later grades.

Extension in the time is to be obtained perhaps largely in that extension of the training day, of which secure beginnings have been made in the supervised play before and after school. Along with this it will also be found in part by distributing the play over the entire daily program as it is placed in the hands of special teachers.

The lack of outdoor play space is very serious at a portion of the schools. If we accept one hundred square feet—a standard which is sometimes advanced—as a fair play opportunity it will be observed that the standard is exceeded in the case of thirteen schools, and in the case of thirty-five schools there is a deficiency of playground space. The following table is based upon the average membership for February, 1915:

TABLE —

## Number Square Feet Per Pupil in Playground

	Sq. Feet		Sq. Feet
University Park .....	1080	Lincoln .....	48
Myrtle Hill .....	608	Edison .....	45
Steele .....	404	Franklin .....	44
Gove .....	332	Byers .....	41
Garfield .....	253	Montclair .....	39
Vassar .....	220	Columbine .....	38
Park Hill .....	184	Boulevard .....	35
Berkeley .....	148	24th Street .....	33
Bromwell .....	141	Garden Place .....	30
Columbian .....	139	Emerson .....	26
Grant .....	131	Hvde Park .....	26
Bryant .....	129	Wyman .....	26
Fairview .....	121	Evans .....	24
Swansea .....	92	Mitchell .....	23
Ashland .....	83	Fairmont .....	21
Villa Park .....	80	Washington .....	17
Smedley .....	71	Webster .....	16
Clayton, .....	67	Valverde .....	15
Alcott .....	67	Central .....	13
Logan .....	59	Milton .....	12
Sheridan .....	58	Ebert .....	5
Cheltenham .....	55	Corona .....	4
Gilpin .....	52	Sherman .....	3
Elmwood .....	51	McKinley .....	1

If the children were handled by special teachers, however, in six different shifts during the entire school day, then, the present provision would be made just six times more adequate for taking care of the children's needs. Most of the playgrounds are now entirely too large for that portion of the day when they are not used, and they are frequently too small for only those portions of the day when they are to be used by the entire school. Efficiency of management is to be brought about by using the playgrounds throughout the entire day.

In a number of places the playgrounds supplied were originally sufficient in quantity, but as the population of the district increased it became necessary to construct an addition to the building. Unless originally very large or unless counteracted through the purchase of considerable additional land, this always proves to be a double misfortune for the playgrounds. The additional building takes up a portion of the original playgrounds, and therefore makes it much smaller, but at the same time increases the attendance at the school. With more pupils to use the ground and less ground to use, the situation turns out to be such as now found at the Corona School. In such cases one or the other of two things is true: either the city is neglecting to take care of the welfare of the children at such schools, or a wasteful amount of unnecessary provision is supplied the schools where there are large playgrounds.

On the side of physical play the needs of children everywhere are practically the same. The amount of playground space needed dur-



ing any one year at one school is practically the same as that needed at every other school. Diversity of management such as represented in the foregoing table simply means that there has been no thoughtful, far-sighted policy. The community has been satisfied to let things happen in one way in one district, and in another way in another district.

The deficiency of indoor play space is very serious. There are very few school gymnasiums in the city. It will be sufficiently easy to take care of this problem in the construction of new buildings, and the policy of including a gymnasium in new buildings is probably indicated by the recent practice of the city. In most of the older buildings it is impossible to supply a gymnasium without the construction of additions to the buildings. In most cases this would take from the playgrounds space that is probably more needed for outside play than for inside gymnasium exercises. When a community must choose between indoor physical training and outdoor physical training in such a climate as that of Denver, it is the outdoor physical opportunity that is to be preferred.

For the present, different plans must be used in different buildings. Where spacious corridors exist, these can sometimes be made fairly serviceable for that portion of the work which cannot properly be taken out of doors. Where fixed seats are placed in the auditoriums, these can be replaced with movable seats, and the auditoriums used for gymnasiums as well. On the first floor especially it will be often possible to supply movable furniture instead of fixed furniture. This will permit a much more effective use of the classroom for physical training activities of a normal type. It may occasionally be possible to rent a gymnasium opportunity in some building near the school. This possibility was not examined into. In still other cases it is clearly desirable that there be the construction of an addition to the building which will provide a large room which will serve variously as gymnasium, auditorium, neighborhood social center, etc.

In the matter of equipment most schools are provided with basketball courts, volley posts, horizontal bars, and parallel bars. Quite a large per cent is provided with facilities for indoor baseball games—which can be played outdoors in Denver most of the year—teeter boards, sand boxes, swings. On the side of material equipment a very good beginning has been made at a number of the schools. The thing now needed is a universalizing of this opportunity. Every child in the city is deserving of as good an opportunity as the best that is now furnished to the children in those schools now best supplied.

For a considerable portion of that physical training which has as its end the development of grace and certain social qualities rather than physical strength and vigor, music is a very necessary accompaniment. One finds rather irregular provision of musical instruments, however,

throughout the city. In some cases there are pianos and Victrolas. In others these are lacking. The printed physical training manual tolerates but does not encourage the use of music. It says: "Do not accompany the exercises too often with music. A constant accompaniment with music has at the end a degenerating and dispiriting effect; it puts to sleep energetic spirit and depresses and lulls the power of will." The current conception is quite the reverse. Music is generally looked upon as an emotional intensifier, as a stimulation to effort, and as an aid to the mental and social exhilaration of rhythmic and folk games. There are good reasons for commending the provision of musical opportunity in those schools where now found, and to recommend that the opportunity be made general throughout the schools.

Before the age of ten or eleven there probably can be no objection to keeping the boys and girls together in the same physical training groups. But after the age of ten, there are reasons for differentiation in the types of training exercises, in part; and in part, for social reasons more particularly, it appears well that boys and girls should receive training together in the same group. There seems to be the problem of handling the work of boys and girls separately for a part of the exercises, and together for a portion of the exercises. For rhythmic and folk games to the accompaniment of music they may well be combined. For outdoor games, sports, athletics, etc., that of the boys, it would appear, should be of a more vigorous, hardy type than that of the girls.

## XVI

## MUSIC

About 7.5 per cent of the recitation class time of the schools is devoted to music. This is greater than the average of 4.8 per cent to be found in cities in general. The total annual investment on account of this subject is therefore about \$85,000, whereas if the usual average amount of time were expended it would be in the neighborhood of \$60,000.

No adequate examination was made of the teaching of this subject. A good many class exercises in the subject were observed, however, and there was also some consultation with individuals who are familiar with the music situation in the elementary schools.

It is fairly certain that the city is not securing more than average results, although giving more than an average amount of time. The impression is at least common that there is an undue emphasis upon the teaching of musical theory in the abstract, and an insufficient emphasis and an insufficient teaching of musical theory in connection with the singing itself, where it is mastered as an incidental portion of the singing. Naturally, there must be some of both, but it is possible to distribute the emphasis in such way as to give too much of it to the abstract, technical matters. Observation indicated the probability of this type of emphasis. In an unusually large percentage of the exercises visited, the whole time was devoted to scales, and notations, and theoretical relationships. This was confirmed by a chance remark on the part of one of the teachers: "We do not follow the course of study in music; we teach singing."

We wish here, however, to express no judgment as to the character of the work, since it was insufficiently examined. Enough was noted, however, to indicate the advisability of having the work carefully examined into by a competent musician or committee of musicians. If the impression to which we have referred and which is fairly common is not well-founded, it is both to the interest of those in charge of the work and of the work itself to have such impressions dispelled completely by the authoritative report of competent, disinterested musicians. On the other hand, if there is justification for the impression, in the interest of the children and of the city in general, the work needs to be changed in certain of its aspects. In either case, the city needs the careful pronouncement of responsible, qualified people.

## XVII

## FINDING THE TIME

We have recommended certain things that the schools are **not** now doing, and we have further recommended frequently the **considerable** expansion of other things that apparently are now inadequately done. Not so frequently have we recommended elimination, or diminution of emphasis. The question naturally arises how the things can be done when already, in the words of one of the teachers: "The days are not half long enough to do all that is now required."

The recommendations have been made with full cognizance of this situation. Conscientious teachers are now expending their time and their energies as fully as desirable or continuously possible. The solution of this problem must come through the gradual adjustment of many factors. Things herein recommended cannot be carried out completely all at once. The thing needed is a program of gradual readjustment of factors, so that in time all can be accomplished without any greater labor than that now expended. Let us summarize some of the things that are to be considered:

1. Topics here and there are either to be eliminated or the amount of time devoted to them is to be diminished: some of the sewing work in the lower grades; certain portions of the drawing; foreign languages in the grades; the systematic drill upon the spelling of words which pupils already know how to spell, and upon words which are not portions of their active vocabulary; certain of the topics in the grammar which are not needed by the pupils in keeping their language correct, etc. It will be found, however, that time is not to be gained mainly by any process of elimination. There are not many things or parts of things that can be eliminated, and when certain matters in a subject are discovered to be useless and to require elimination, as possibly a few things in the history, it will generally be discovered upon looking further that there are very many other things needed which will much more than take their places. As a matter of fact, the program of education for the present and the future must be much more extensive than that needed in the not greatly distant past.

2. The time must be mainly gained through more effective methods of teaching. It will be necessary to define more clearly the things that we are after so that parents and pupils can see and realize

the ends in view. It will be necessary to provide much more fully and adequately for the material opportunities for performing all of the necessary exercises in an effective manner. Very much of education is now ineffective and expensive when measured in terms of results just because of the short-sighted policy of attempting to get work done without the necessary tools for the work.

3. The elementary schools must learn that it is not necessary always to teach a subject through the entire year. It is possible to alternate subjects and thus have fewer upon the program at any one time. For example, after teaching drawing for a half year, it may be possible to teach grammar for another half year; during the half year when the subject is not taught, it can be kept fresh through attention to application within the work of the other subjects.

4. Time will be found by combining matters that are now to be found separated and placed in different fields or studies. Teaching things together that belong together will not only mean economy of time, but effectiveness of work. For example, in teaching the topic of railroads at the present time, we give a fragment of it in the history class, another portion in the geography class, stocks and bonds and other financial aspects in the arithmetic class, community regulation of railroads in the civics class, etc. To teach the topic in an organic way as a thing in itself will mean greatly improved conditions of teaching each of the parts, and it will present them all together, and not one at one time in the year and another at another time, probably in a different year. "In union there is strength," applies as fully to the organization of educational materials for effective procedure as to anything else. If one will glance over the topics enumerated in the chapters on history, geography, civics, elementary science, etc., one will observe the possibility of treating a large number of the topics once for all in one class to the end of both economy and effectiveness. At the same time the student will have to do a great deal of reading, and much of the school's supervision of practice in the mechanics of reading is thus taken care of in connection with the same situation. Moreover, in ways previously mentioned, these topics offer the best possible opportunities for training in oral and written composition. As new subject matter is presented intelligibly and discussed intelligently, the pupil's vocabulary is expanded. By enforcing correctness in the spelling as the written work is prepared, the spelling is taken care of. By having a good deal of written work for other purposes mentioned, pupils secure practice in handwriting. As the treatment of the topic is made quantitative, students receive training in applied arithmetic.

We are not here saying that these various subjects can be combined in any complete fashion in all their extent. As a matter of fact, it is probable that at certain times and on certain levels all of these subjects

need to be taught separately by way of giving the preliminary ideas, preliminary information, and by way of permitting an understanding of the information in a sufficiently detached form. The various subjects need to be studied, each in isolation from the other. But at the same time, for a large part of the training, it is certainly possible to organize the various activities around topics instead of in subjects, and as they are organized about topics, to introduce a wealth of experience and information and practice exercises that have been regarded as properly belonging to individual subjects. We are not here trying to recommend any system of so-called "correlation." The term is probably one that does more mischief than good, since it starts from pre-modern educational presumptions. The thing to which we need to look is not correlation, but an effective organization of the things which we need to organize for teaching purposes. It is believed that in the organization of materials here suggested one of the two or three major tasks relative to method will have been accomplished.

5. A clear distinction needs to be made between the methods that are to be employed in the preliminary teaching within a field of study or discipline, and those required where practical application is the end in view.

6. Education is to be made as fully as possible what we have called experiential instead of being merely fact-learning. The distinction is more needed for training in the fields where books are the usual instruments than it does for fields of practical activity, since in the latter the mistake is not so frequent, nor so serious as in the former.

7. Pupils are to be so trained in methods of work, and so motivated by the conditions provided for the activities that the burden of effort is thrown far more largely upon them and less upon the teacher. This is to be done not merely for economy, but also for educational effectiveness. Self-directed training is always more effective, the proper opportunities and sufficient guidance being present, than coercive education.

8. Different standards will be set up for different types of people. The schools will not try to bring everybody to high ability in spelling, handwriting, speed and accuracy of arithmetic, skill and certainty in music and drawing, etc. We do not try to give everybody the same degree of muscular strength, nor determine that everybody shall be of exactly the same size and height. We are content to develop large muscular strength where it appears that nature intended that there might well be large muscular strength, and we are content after making people sound in health to leave many of them with far less muscular strength, since it appears that nature intended that they should have a less degree of such strength. Now there is no reason to think that



nature intended all people to be of the same ability in spelling, in handwriting, in speed and accuracy in arithmetic and in the other things. While strength must be recognized and given its full opportunity, weakness must also be respected and the individual brought to be only what he can well be through normal effort. As business men complain that pupils cannot spell well enough, or write well enough, or figure accurately enough, the thing to do is not to try to force all of them through exactly the same mill, and bring all of them to exactly the same level of accomplishment; it is rather to introduce vocational guidance, to train those to strength who have the capacity for strength, and to guide them into the things for which they are qualified. Those whom nature decreed cannot qualify for clerical occupations involving the needed speed, accuracy, etc., must be guided into occupations that do not make such high demands upon them in matters in which nature decreed that they should be weak. The problem of meeting the world's needs is as fully a problem of vocational guidance of the right people into the right work as it is a problem of proper training of those people for that work. Both natural and acquired characteristics are to be taken into account. At the present time there is large waste in time and effort in trying to bring the weak up to a level for which nature never intended them, and there is also an equal waste of opportunity on the part of the strong because conditions are not such which permit their fullest and most effective development.

9. There is the further problem of devising and organizing stimulations to effort on the part of the pupils. These need to be in part social, in part parental, and in part those organized and exercised by teachers. It will be necessary to employ the motive of interest, and to supply the things needed for awakening this motive; to introduce the utilitarian motive or social motives, like ambition, emulation, love of display, etc. The driving force must usually be within the pupil himself. Sometimes external coercion by parents, teachers, or employers will be necessary. Sometimes pupils will be brought to view distant ends by way of motivating present conduct. Sometimes they will be brought to work toward distant ends, but their own attention will be focused upon things near at hand without any consciousness whatsoever of the distant objectives held in the mind of the teacher. Sometimes teachers will bring pressure to bear directly upon the pupils; sometimes indirectly by setting conditions, and at still other times indirectly by working through parents or other social groups that have influence upon the individual.

It is not our intention here to enter into any adequate discussion of these complicated matters. We wish only to indicate that the factors and the complications are so great, and the opportunities for increasing the effectiveness and economizing of time so numerous that it is

decidedly unsafe for teachers and school authorities to decide that nothing more can be done simply because there is not time to do more.

It is the judgment of the writer that all of the valuable positive training that is now accomplished by the schools could be accomplished with one-half the teaching labor that is now given to it, if all possible adjustments were made along the lines indicated in the above list of factors and in other recommendations made in this report.

## **Part II**

# **THE WORK OF THE SCHOOLS**

**High Schools. By Charles H. Judd**

*The University of Chicago*



**I****GENERAL COMPARISON****High Schools are Very Different in Equipment and Organization**

The most striking fact which one notes in visiting the high schools of Denver is that these schools are very different from each other in their equipment and internal organization. This is explained in part by the history of the schools. Prior to the consolidation in 1903 the schools were, with the exception of the East Side High School and the Manual Training High School, in separate districts, under separate managements. Since the consolidation there has been some effort to bring the high schools together into a single system, but this effort toward centralization has not gone as far in the case of the high schools as in the case of the elementary schools. If the high-school students in different sections of the city are to have the same kind of opportunities, there must be a very much more vigorous effort to give all the schools a full equipment and to organize the work of each school in conference with representatives of the other schools.

**Influence of the East Side High School**

Another impressive fact which is faced at every turn is the large influence which is exercised, and was exercised even before the period of consolidation, by the East Side High School. This school was established in 1873. It became very shortly after its establishment one of the leading high schools of the country. One of its early principals, Dr. James H. Baker, afterwards president of the State University, took an active part in the discussion of high-school problems in the National Education Association, and was recognized as a leader among the high-school principals of the country. Dr. William H. Smiley, who succeeded Dr. Baker, was also prominent in national educational circles. Both of these men were associated with the committee which in the early '90's did much to organize high schools, namely the Committee of Ten. Dr. Baker was a member of the general committee, and Dr. Smiley was a member of the subcommittee on Greek. Students went from this school to the chief universities of the country and maintained them-

selves with high rank in these institutions. Many of the leading citizens of the city of Denver are graduates of the East Side High School. That school enjoyed a prestige which made it the natural example of all of the other schools which were organized later.

The course of study in this school was from the first a rigorous, disciplinary course, dominated by literary and classical interests. The issue between science and the classics was clearly drawn even in the early years of the East Side High School's history, but the victory has always been with the literary subjects. A quotation from Dr. Baker's first report in 1876 throws light on this matter:

"In that department of the high school which is preparatory for college we have no power of choice. The course is determined by the requirements of the colleges and to those requirements we must conform. When they shall have more sympathy with the public schools, changes if desired may be made. There is a theory which appears essentially true, that from the beginning of the high school course the sciences should be studied in conjunction with the disciplinary studies of Greek, Latin, and Mathematics, and that the elementary knowledge of them should not be postponed to the last two years of the college course. Certain it is that whenever the mind is disciplined in any direction, its unconscious workings strengthen the foundation already laid, and thereby render the superstructure more firm. Whatever the study, the element of time seems all important in our education. The same reasons that would make science desirable in a preparatory course would warrant the judicious teaching of carefully selected scientific topics to the lower grades.

"This view has not been adopted by the colleges, but something has been done to give in the aggregate less Greek and more science to those who prefer such a course—not, however, with a view to reduce the amount of Greek and Latin in the regular course. Yet there is no institution in the country worthy of the name of college that recommends a preparation which does not embrace more or less Latin. There is danger, great danger, that in the rage for science which naturally enough follows the giant strides which its several departments are making, the so-called 'humanities' may be for a time neglected, although eventually, the scientific studies must find their due limitation."

The kind of a course of study which was thought of as necessary in those early days reflected itself in the kind of a building which was erected. The East Side High School building was, in its day, a conspicuous model of high-school architecture. The high ceilings and great corridors and large classrooms showed the generous intention of the citizens of Denver. There were, however, no gymnasium, no lunch-room, no shop for manual training, and no special equipments for



science courses. In short, the East Side High School stands as a conservative example of a school, strong in its early days, but unable in these days to take on the progressive features of a first-class high school because of physical limitations and because of the hampering traditions which come from a successful past.

### **Experiment of Separating Academic Courses from Manual Courses**

The literary and classical example of this first Denver high school has had its effect in the life of all of the high schools of the city. One important effect can be seen in the experiment which was tried in the establishment of a separate school for the manual arts. When the Manual Training High School was organized in 1894, it was believed by many that a differentiation of high schools was the best way of providing for students who did not want the literary or the classical course. At that time none of the better colleges of the country admitted to their courses students who had not taken Latin. Indeed, in many cases, a course in Greek was required for admission. Within the last twenty years there has been a great change in higher education. State universities have forged rapidly to the front, offering to high-school graduates a great variety of elective courses and requiring none of the traditional classical preparation. There is no sharp line of distinction in the higher institutions between students who take the literary courses and those who are pursuing technical and manual courses. The state systems of education and many leading city systems have tended in their growth away from the division which was exhibited in the organization of a separate manual training school. The typical modern high school is broad in its course of study. The North Side High School is the best example in Denver of the kind of school which is usually being organized in American cities. Here both manual courses and literary courses are offered side by side. Students may go from one to the other, including both in a well-organized high-school curriculum. Furthermore, as indicated above, the students who take such a combination curriculum find themselves able to go to college in all of the progressive institutions. The motive for a sharp distinction between the student who has a classical education and the student who has another type of education has, therefore, been steadily disappearing. The result is that the East Side High School and the Manual Training High School are today by no means the most impressive examples of successful and complete secondary education.

Indeed, in the Manual Training High School itself, there have appeared in increasing numbers courses which were originally thought of as the exclusive property of the academic schools. It is quite possible to get courses in the Manual Training High School in Latin, modern

languages, English, and other literary subjects. In short, the Manual Training High School itself has tended in the direction of a comprehensive organization. The experiment of a separation between the two types of schools can fairly be described as superseded by a tendency to enlarge each school so as to include as far as possible the different kinds of opportunity for each student.

The problem suggested by this historical sketch will come up again in later sections of this report. The purpose of the present statement is to show some of the reasons why there is lack of unity in the present high-school system of Denver.

### **West Side High School**

The high schools other than the East Side High School and the Manual Training High School grew up, as was pointed out earlier, in separate districts. The West Side High School was organized in 1880. It followed closely the example of the East Side High School. The mathematics courses have been emphasized in the curriculum of the West Side High School. There is at the present time no opportunity whatsoever for courses in domestic science or manual training. Some work in domestic science was undertaken a year ago in the effort to interest the girls in that type of study, but this work had to be conducted in one of the science laboratories and it did not seem feasible to continue it.

### **North Side High School**

The North Side High School graduated its first class in 1886. It was organized in 1883. This school originally had a three-year course. Since it moved into the new building and took on its present form of organization it may be described as the best equipped school in the city of Denver. Its internal organization makes it possible to offer courses that the East Side High School cannot offer. It is the best organized school in the city at the present time.

### **South Side High School**

The South Side High School was established in 1892. At that time it had a three-year course. This school is situated so far from the East Side High School that it has attracted a steadily increasing number of students who live in the southern districts of the city. The community has been very desirous of retaining local high-school privileges. Since consolidation the school has been maintained, even though its equipment is very limited. It is, perhaps, more strikingly in need of space and material equipment than any of the schools.

## **The Latin School**

In 1906 the first year of a high-school course was opened in the Broadway School. This school is regarded as a part of the East Side High School, and no separate reports are made of its work. The equipment of the building is below the level of most modern rural consolidated schools. The building is decrepit to a degree that is hardly thinkable in a great city school system. Elementary science is being taught with an equipment inferior to that which would be supplied by most domestic kitchens.

## **Longfellow School**

The first year work in manual training was organized in the Longfellow building in 1907. In 1911 this was changed to a technical course in view of the fact that general manual training courses were opened in the North Side High School. In 1914 this school was discontinued. The statistics for this school are included, so far as this report is concerned, with those of the Manual Training High School.

## **Strong Characteristics of the Schools**

In the foregoing discussion and in subsequent sections of this report there is danger of emphasizing unsolved problems to the exclusion of those laudatory comments which are justly called for by the many virtues of the schools. As will be shown in this report, Denver high schools have grown steadily. The course of study has been enlarged. The teachers in these schools are doing in the main faithful work, and pupils are in general prepared with their lessons. In a certain sense it is fair to assume all this and bring out as the main subjects of treatment in a report of this kind those aspects of the system which need remedial attention. The report should not be understood as a mere criticism of the schools. There is, indeed, danger that the older citizens of Denver who have known of the strength of the East Side High School will fail to understand the demand for a radical enlargement of that school and of the system as a whole unless it is pointed out explicitly that the kind of school organization represented by that school and the others which have followed its example closely, namely, the West Side High School and the South Side High School, is open to the charge of failing to keep pace with the growth of secondary education in the country. In like degree, the system of high

schools has failed to reach the degree of efficiency which the city has a right to expect and a duty to demand.

The North Side High School is distinctly better in its organization, its equipment, and in the work that is done, than any other school in the city. It is to this school that attention should be turned in working out the plans for a larger and more highly centralized secondary-school system throughout the city.

## II

### MATERIAL EQUIPMENT

One very simple way to get evidence about a high school is to study its material equipment. Comment has been made on this matter in some of the earlier paragraphs. We turn now to a statement of certain of the most important deficiencies in the material equipment of the Denver high schools.

It is important in this connection to bear in mind that the Denver School Board has adopted the policy of building its buildings out of current income. The city is not bonded for its school buildings. The result is that Denver has a collection of buildings which look backward rather than forward. While other cities of like size have seen the wisdom of putting up in rapid succession modern buildings equipped with the space and apparatus necessary for the training of the oncoming generation, while other cities have seen the wisdom of letting the next generation bear a part of the cost of this more complete education, Denver has built her schools out of her savings. The result is that Denver is behind cities of like size in her buildings in general and distinctly behind in her high-school equipment.

It is unfortunate that the schools should suffer from the reaction against bonding which comes from the experience of the city in other improvements. If Denver is to go on equipping her schools on the physical side out of current income, it is important that a systematic plan for enlarging the high schools be worked out. The schools are growing steadily and are sorely in need, not merely of more space, but of modern equipment. It is recommended that a plan of continuous enlargement of all the high schools be drawn up at once. The following report will furnish, it is believed, the material necessary for the major part of this program of enlargement:

#### Equipment for Physical Education

The only high school in Denver which has a gymnasium is the North Side High School. At the time that the East Side High School was organized it was not thought of as important that the school should take measures to develop the physical systems of its students. No gymnasium was included, therefore, in the equipment of this building.

The other schools followed the example of the East Side High School. So strong is the conservative spirit in these matters that the North Side High School has never been able to equip its gymnasium in such a way that the room can be used advantageously for the purpose for which it was erected. Here is a room and the facts show that there is also a very impressive demand for opportunities which such a room should afford, but no equipment is supplied after these years of occupancy of the building. The following report from the principal on the use of the gymnasium puts the matter in more emphatic form than could any comment by the members of the Survey Staff:

"With reference to the gymnasium: At present this room is used two days a week for work with the girls. Thus far neither adequate equipment nor an instructor has been secured for the benefit of the boys. However, much use of the gymnasium has been made in the afternoons after school hours, in the evenings, and to some extent on Saturdays. Under the supervision of teachers a large number of both boys and girls play games after school. Once a week during the second and third quarters, the pupils are allowed to dance for about an hour. Teachers' and other outside organizations use the gymnasium three or four nights a week. Inter-scholastic basketball games are played on Saturday."

In the West Side High School a strenuous effort has been made to secure some of the advantages that would come from gymnasium exercises by using the corridors of the building. The principal and the members of the faculty of this school recognize that a gymnasium added to the equipment of this school would serve not only the purpose of developing the students physically, but would also offer a greatly needed opportunity for improvement of the social life of the young people.

In the early days of secondary education in this country when communities were small and opportunities for suitable recreation were easily secured by each member of the community, it was not necessary for the school to give as much attention to these matters as it is today. Today the population crowded together in large cities must be trained in the use of its leisure time as well as in the ordinary subjects of study. This training is essential to a wholesome social life and essential to the best realization on the part of the individual of all of the ends for which the school works. Moral life depends upon good physical conditions and good recreations as well as upon good intellectual training. No community is completely supplied with the means of educating its young people unless attention is given to physical training.



The urgent need for some enlargement of the equipment of the Denver schools in this direction has been recognized by several organizations in the city. The women's clubs of the city have prepared a report, showing the inadequacy of the present equipment. This report was supplied to the Survey Staff with the urgent recommendation that attention be drawn in the survey to this lack of equipment. The table compiled by this organization is as follows:

CITY AND COUNTY OF DENVER, COLORADO--SCHOOL DISTRICT No. 1  
 High School Physical Education

April, 1916

NAME	LOCATION	Number Belonging April, 1916	PLAYGROUND		EQUIPMENT						VACANT LOTS			GYMNASIUM				Have You Showers? How Many?	Have You Physical Director for Boys?	Have You Physical Director for Girls?			
			Nearest Park or Municipal Playground	Area in Square Feet of Your Playground	Basketball Court	Volley Posts	Horizontal Bars	Parallel Bars	Indoor Baseball	Outdoor Baseball	Soccer Grounds	Athletic Field	Do You Use Vacant Lots for Play Purposes?	How Many?	How Near Building?	Is Locality Building Up Rapidly?	Have You Gymnasium or Playground?	Have You Auditorium Available for Gymnasium?	Is there a Building in the Locality which might be used for that purpose?	Have You a Swimming Pool?			
HIGH, EAST .....	19th and Stout .....	1100	Curtis, 13 blks. ....	None	0	0	0	0	0	0	0	0	Baseball Track	1 blk.	2 blks.	....	No	No	No	No	Yes 2	No	No
HIGH, MANUAL .....	27th Ave. and Franklin ..	1100	City Park, 7 blks. ....	10,000	0	0	0	0	0	0	0	0	Yes	Several	4 blks.	Yes	No	No	No	No	Boys 1	No	No
HIGH, NORTH .....	Lake Pl. and Elliot St. ....	1420	Highland P'k, 2 blks. ....	None	In Gym.	0	0	In Gym.	In	0	0	0	Baseball Football	.....	10 blks.	Yes	Yes	.....	.....	No	Yes 4	No	Yes**
HIGH, SOUTH .....	S. Pearl and Colo. Ave. ....	500	Platte Park, 4 blks. ....	None	0	0	0	0	0	0	0	0	For Baseball	.....	1 mile	Yes	No	No	No	No	Yes 1	No	No
HIGH, DEN. SCH. TRADE	Lake Pl. and Elliot St. ....	49	Highland P'k, 2 blks. ....	None	0	0	0	0	0	0	0	0	None	.....	.....	Yes	.....	N. High	N. High	No	N. High	No	No
HIGH, WEST .....	West 5th and Fox St. ....	439	Lincoln Park, 10 blks. ....	None	0	0	0	0	0	0	0	0	Baseball Football	10	5 Baseb'll	No	No	No	No	No	Yes 1	.....	No
HIGH, EAST LATIN .....	14th and Broadway .....	238	23d & Welton, 10 blks. ....	18,000	1	1	0	0	1	0	0	0	Baseball	2 or 3	City Park	No	No	No	No	No	No	No	No

\*\$20.00 per month, used at the discretion of the High School Principal, is being paid to some regular man teacher in the school who can coach the boys in football, basketball and baseball.  
 \*\* One woman physical director is at North two days a week, dividing the other three days between West and Latin

The Denver High School Woman's League has also made the matter a subject of special study and has prepared a report on the subject, from which the following extracts may be quoted. The report itself is too bulky to include it in full:

"Questions were sent out covering four general points: first, physical education, compulsory or elective, open to all; second, equipment; third, a physical examination, and fourth, the employment of a physical director. Replies were received from thirty high schools, representing ten states: Massachusetts, Pennsylvania, New York, Minnesota, Illinois, Maryland, Texas, Washington, California, and Colorado. These replies were from towns with a population varying from 8,000, or 30,000, or 44,000 to that of the larger cities, New York, Chicago, and Philadelphia.

"The first point covered was general physical education. In these thirty high schools it was found that twenty-eight made provision for physical training, open to all. In seven the work is elective, in twenty-one compulsory, in one for one year only, in three for two years, in one for three and one-half years, and in fifteen for all four years. Twenty-three of the thirty give credit for the work done, usually counting it as unprepared or laboratory work.

"The second question was in regard to equipment. Twenty-five of the thirty schools have a gymnasium with showers except in three instances, six a swimming pool, and seven an athletic field or stadium.

"As to the third point, it appeared that sixteen schools made provision for a physical examination of all taking part in physical work, and twenty-two for work based on the examination or for corrective purposes.

"And fourth, in twenty-two of these schools a special director is employed, whose duties are limited to those related to physical education."

(Examples are here given of several well-equipped school systems, including one in Massachusetts.)

"We expect things educational from Massachusetts, but we may now turn to our own state, to Pueblo, a city with a population of about 44,000. There are two high schools, each of which is provided with a gymnasium and showers, one with an athletic field and the other with a swimming pool. In both high schools physical education is compulsory, in one for two periods a week for one year, and in the other for two years. In both cases some credit is given, in one the physical examination is required, in the other not required but usually made in the fall and spring for comparison. Corrective work is carried on and in both schools the work is in charge of a special physical director with no academic duties, one of which receives a salary of

\$3,000 a year. Every effort is made to interest all the pupils in some form of athletic work. Faulty habits of standing or sitting are corrected and special prizes are given for good posture. Sometimes there are as many as ten basketball teams in the schools; not first, second and third teams nor class teams, but teams including all who wish to play. They play a series of contest games among themselves, and from these teams the players are chosen for interscholastic games.

"Here we may turn to the consideration of the work done in Denver. Perhaps it will be well to remember the advice of the philosopher who said, 'Young man, never find fault with the weather; be thankful there is any weather at all.' We find that we have no system of physical training open to all. Our sports are necessarily conducted for the few who have the time, the interest, and the strength to engage in them. As to equipment, we find that for our five high schools we have one gymnasium, inadequate showers, and no swimming pool. We have no physical director for the boys, and only one for the girls, whose time is divided among three buildings. In one of these buildings the work is elective for two periods a week, but because of the difficulty in arranging schedules, and the limited time of the director, many girls are unable to take part in the work that they wish to do. In one building the work is compulsory for two years, twenty minutes being given twice a week, not in the gymnasium in suitable clothing, but in the school hall in the usual school dress. In one building twenty minutes is given once a week with the same inconvenience of place and unsuitable clothing. Other than this we have made no provisions for our girls. Some provision has been made for the boys and their sports but none for the girls. All direction along this line has been volunteer work. No teacher, no matter how much interested or how enthusiastic, can, in the short time available after school hours, do more than touch this important matter on the outside. The vital issue remains unaffected. Furthermore, we have no provision for physical examinations, even of those entering upon contest games."

### **Luncheon Arrangements**

A second deficiency in material equipment to which attention should be called as pointedly as possible is the lack of provision for lunchrooms in the schools. The North Side High School has lunchrooms which accommodate at one sitting seven hundred students. In order to make it possible for the students to secure their luncheons in this space it is necessary to arrange the program in such a way that students come to the lunchrooms, some at one hour and some at another. In the East Side High School a part of the basement was fitted out at the beginning of this school year to serve as a lunchroom. A number of the students can be found standing in this lunchroom at each noon

hour because the number of seats is not adequate. Still more deplorable is the fact that a number of the East Side High School students are obliged to take their luncheons on the streets or in the small shops around the school. Some of the members of the school have been observed by the writer at least four blocks away from the building, standing around on the sidewalks eating their luncheons. The Manual Training High School has a lunchroom accommodating between two and three hundred students. The West Side High School has a small room accommodating about two hundred and twenty-five. The South Side High School has no lunchroom. The students are allowed to eat about the building wherever they can find a place. In all of the schools a certain number of the students patronize outside shops which cater to their wishes, or they follow the example of the East Side High School students and walk about the streets and eat luncheons which they have brought with them.

All of these facts go to show that an important part of the social life of the school has been in too large a measure overlooked. When the city was small and when the students came from homes in the immediate neighborhood of the schools, it was possible for them to go home at the noon hour. That time has long since passed. The school program requires that students be present both afternoon and forenoon in the school building. There is only one rational way of enforcing this requirement and that is to provide suitable arrangements for the noon meal. This noon meal should be served in a fashion which is at once hygienic and in conformity with good social taste. If this demand is neglected, results of an unfortunate type are sure to follow. Let us consider the matter merely from the side of the training which it gives in manners. Whatever may be said of the desirability of a boy's eating his luncheon on the city streets, one can hardly contemplate with any degree of tolerance the congregating of three or four young women on a street corner, each munching a sandwich and eating salad out of a pasteboard receptacle supplied at a neighboring shop. A certain romantic Bohemianism may be illustrated by this sort of informal picnicking indulged in on suitable occasions, but as a regular performance it is likely to undermine unduly the conventions which are supposed to be cultivated as a part of a higher education.

The neglect of this matter of luncheons for the students goes, however, even further than can be indicated merely by a comment on manners. Provision for the conduct of a lunchroom is one of the important elements of school hygiene. There is the necessity of trained workers and there is the necessity of providing food which will stand the most vigorous tests of sanitary science. It appears that the lunchroom in earlier years was found by the Board of Education to be a financial problem. Indeed, in earlier years the Board of Education was called upon from time to time to contribute to a deficit accumulated by the

lunchrooms. This year strenuous measures were adopted, and the lunchrooms, such as they are, have been conducted without loss. Indeed, it is reported, though somewhat indefinitely, that a surplus has been accumulated up to the first of April approximating seven or eight hundred dollars. The method of accumulating this surplus is interesting. The Board of Education asked for bids on various articles of food, especially on meat. These bids on meat were accepted among others, and the price was guaranteed for a year. It was recognized that the price of eggs and the price of butter cannot be guaranteed for a year, but the price of meat, it was thought, can be. Anyone familiar with the fluctuations in the market will, of course, be surprised that the price of meat can be guaranteed for the same length of time. The head of the lunchroom is obliged under this contract either to reject meat as unsatisfactory in quality or to purchase all meat at the same place and at the contract price. This is an undesirable method, to say the least, of insuring good meat for the lunchroom. It would be very much better for the citizens of Denver to go to the expense of paying a slight deficit for lunchrooms rather than run any risk whatsoever of securing supplies that are not selected regularly by the most competent director of lunchrooms who can be employed. All fresh food, including meat, should be selected with the greatest care and should be selected from the open market where its quality can be insured by constant comparison with the material supplied by all of the best establishments. The places where such supplies are bought should be determined by a well-trained expert. The Board of Education should not determine the place where meat is bought, nor the price.

Another symptom of the lack of satisfactory organization of the lunchrooms is seen in the fact that the Board of Education has not provided any adequate means of collecting and depositing in the business offices of the board the cash collected. The present director of the lunchrooms has to use her own house as the depository for the funds which she collects. This practice has incidental disadvantages which can readily be imagined by anyone acquainted with good business methods.

In short, it appears that the lunchroom situation has been allowed to drift without being seriously recognized as one of the important items in the life of the school. Not until the schools take up this matter seriously and actually provide proper equipment and the highest grade of expert management will this branch of the schools be organized in a way which comports with the dignity of the city and with the needs of the young people.

This item furnishes, perhaps, one of the best possible texts on which to base a series of comments regarding the enlargement of the functions of the school. It is no longer the business of a secondary



school merely to train in algebra, Latin, and ancient history. It is the business of the secondary school to cultivate in a broad way the knowledge of hygienic principles and the higher social tastes of all students. A well-conducted lunchroom is quite as important as some of the courses given in the secondary school. It becomes the more important the less satisfactorily it is organized.

## **Material Equipment for Literary Courses**

Material equipment is, of course, essential to the conduct of certain courses. The most conspicuous illustration of elaborate equipment is that which appears in the shops of the Manual Training High School. Evidently courses in technical subjects could not be carried on without machinery. The city has been generous in supplying the shops in the manual training building of the North Side High School and in the Manual Training High School with elaborate equipment.

In sharp contrast with these technical courses are many of the courses in literary subjects in which the equipment demanded for class-work is relatively meager. Attention should be called, however, to the fact that even in those courses which are supposed to be of a textbook type, maps and supplementary volumes to which students may be referred are essential to the best work. While the equipment of the technical courses is obviously demanded for the organization of the courses, the need of equipment in a course in history is so likely to be overlooked that it becomes an important duty of such a report as this to concentrate attention on the equipment needed by such courses. We find throughout the high schools of Denver abundant evidence that this demand has not been adequately met.

A series of statements with regard to the maps now in the different schools will perhaps serve to make clear the lack of equipment in this respect and the difference in equipment in the different schools. The following paragraphs are taken from the reports of the principals of the different schools in regard to the maps which these schools have:

### **East Side High School**

"There are in the school fifty-eight maps distributed as follows: In the map case, second-floor hall, easily accessible, thirty-six; in twelve rooms and third-floor hall, twenty-two. The maps in the third-floor hall are used by various classes in science, including Commercial Geography, Geology, Astronomy, Physiography, General Science, Physiology, Zoology and Botany. About a third of the whole number should be replaced by similar maps in good repair and of recent date."

## **North Side High School**

There are fifty-four maps in this school. Nearly half of them are in two rooms. One of the two rooms is devoted to instruction in American history, medieval history, and modern history. Other teachers of history are at liberty to borrow maps from this room. The second special room is one in which the courses in physiography are given. This room is supplied with certain relief maps which are needed for the special purposes of this course. "Maps and charts are really necessary for effective work in most of the departments, and especially so in history, science, and language. Material of this kind should be used freely to illustrate and to make concrete matter in the textbook. By exchanging maps teachers make the maximum use of those we have. However, we could use profitably more equipment of this kind."

## **South Side High School**

"We have eight wall maps used in history and Latin and will have, as soon as they are mounted, twelve new outline maps to be used in various departments."

## **West Side High School**

"Twelve maps. These are in five rooms. We have nine new ones now being mounted for us, but not yet in the building."

## **Manual Training High School**

"The number of maps in the building is approximately fifty-five, distributed as follows: Greece, six; Italy, six; United States, five; Western World, four; Roman Empire, six; North America, one; World, eight; Europe, seven; Denver, three; Colorado, two; miscellaneous, seven. Each teacher of history has access to any and all of these maps, at all times as needed."

These reports show that the maps are very unevenly distributed to the different schools. The small school needs maps as much as the large school. The larger number of maps in the large schools, as the reports show, are not to be explained as mere duplicates. No school can get on well without maps showing in detail the different countries studied in the courses in literature, history, and science.

To be concrete, the writer visited with interest class after class in which first-year students were reciting lessons in ancient history. The course is required of academic freshmen. The rooms were, in many cases, absolutely without maps. Not even a diagram on the board was used to explain the relations of the countries under discussion.

## Domestic Science

It would require more space than is appropriate to detail the equipment in all the departments. One other conspicuous example of lack of equipment must suffice for this part of the report. Only two schools, the North Side High School and the Manual Training High School, have equipment for domestic science courses. Traditionally, science has been for the boys more than for the girls. Somewhat late our civilization has impressed it upon every student of education that there is need of more application of science to the common affairs of life. Educators are aware of the need of a scientific study of domestic life. The principals and many of the teachers in the East Side High School, the South Side High School, and the West Side High School, want courses in domestic science. What stands in the way of the opening of such courses? First, the failure of citizens to realize that a study of science and an application of science to home life are quite as appropriate for girls as a study of mechanical principles is for boys. Second, lack of a keen appreciation on the part of the community that suitable courses in domestic science are absolutely essential to the completely-rounded modern high-school education. The schools are today teaching many girls typewriting, but not the applications of science to home life. Denver needs to be aroused in this matter.

*Recommendations:* It is recommended that there be set aside a liberal and definite sum of money for the expansion of the equipment of the high schools for each year during the next decade. This sum should not be compromised in any way by the need of rebuilding the East Side High School. It should not be confused in any way with the demand for a great enlargement of the South Side High School. The sum should be for equipment alone.

Second, a careful study should be made of the future building needs. It is suggested that the plan be considered of consolidating the West Side High School with the South Side High School in a single new building on the South Side, somewhat nearer the present site of the West Side High School than is the present South Side High School.

It is suggested that the proper development of the high schools would be greatly facilitated by financial measures which would make it possible to deal very soon with the larger needs in the way of buildings.

It is recommended that in this building program provision be made for the enlargement of each center so as to include the chief lines of work. The further discussion of this recommendation will fall in the sections dealing with the course of study.

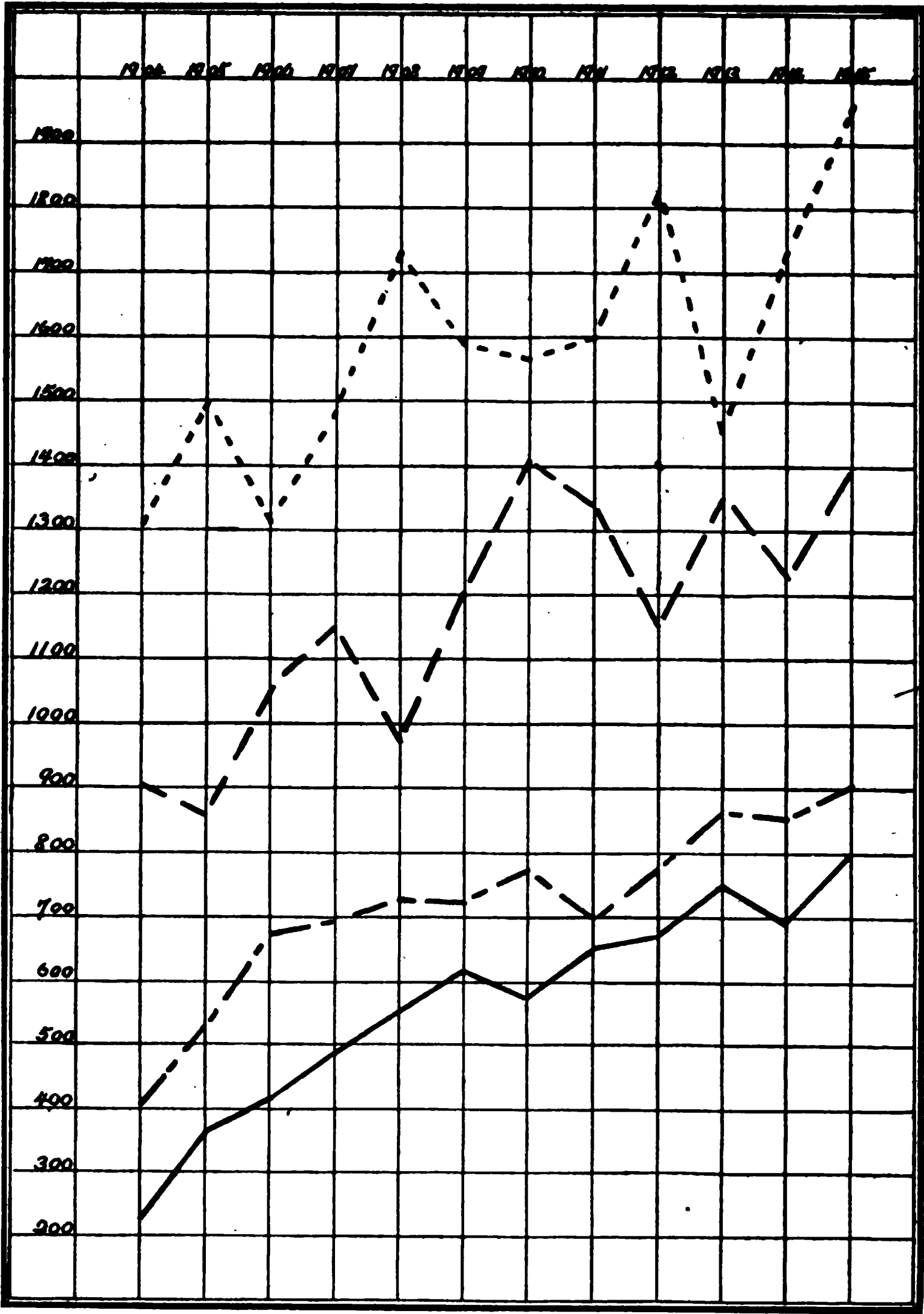


DIAGRAM I

Showing the increase in registration of all the high schools from year to year by classes. The number of students is indicated by the figures at the left of the diagram, the years by the figures at the top of the diagram. The classes are distinguished by the lines as follows:

- Freshmen
- - - - - Sophomores
- . - . - Juniors
- Seniors

### III

## INTERNAL ORGANIZATION

### Student Population

The Denver High schools have shared during the last decade in the great development of secondary education throughout the country. Diagram I shows in graphic form the growth in the number of students in each class in all of the schools for a period of years. The period covers almost the whole time since consolidation. Statistics for the first year are not available.

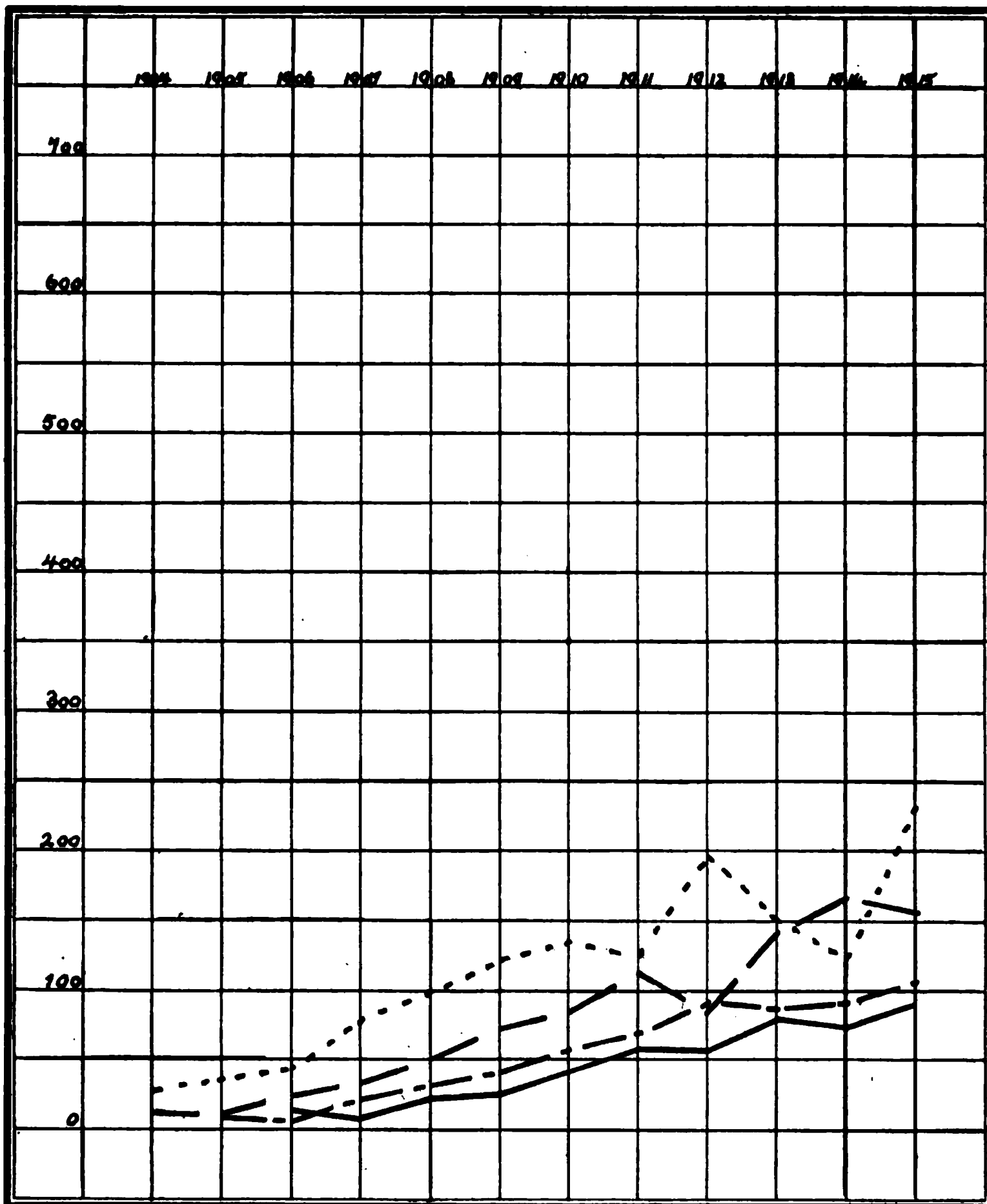
The uppermost line shows how, with sundry ups and downs, the freshman class has been climbing upward. The next lower line shows the sophomore class. It should be noted that the sophomore line is, as a whole, far below the freshman line. This means that many freshmen grow discouraged and drop out or are eliminated for poor work. It will be noticed, too, that the two lines do not follow the same course. This fact is explained in part by the necessity of waiting a year in each case to get in the sophomore class the benefit of any sudden rise in the freshman registration.

Even explaining some of the lack of agreement in the two uppermost lines in this way, we note the extreme irregularity of the upper lines as contrasted with the two lower lines which show the history of the junior and senior classes. Furthermore, attention should be fixed on the long drop between the sophomore class and the junior class.

These facts brought out by the diagram show that the first two years are periods of readjustment and selection and deserve the most careful study.

One method of carrying on this study is to draw diagrams similar to that just discussed for each of the schools. Diagram II shows the simplest case, namely, that of the South Side High School. This school has increased slowly in each class. The irregularities in the first two years are most notable in recent years. Furthermore, the drop between the sophomore year and the junior year is not so marked as in Diagram I, where all of the schools are put together.

Diagram III shows the history of the West Side High School. For a period of years this school lost in all classes. The first-year class is the most irregular. For some years past this class has given promise of increased attendance, but the promise has not been fulfilled. There is a relatively large drop between the first and second years.



## DIAGRAM II

Showing the growth of classes from year to year in the South Side School.  
The classes are distinguished by the lines as follows:

-----	<b>Freshmen</b>
-----	<b>Sophomores</b>
-.-.-.-.-.-	<b>Juniors</b>
-----	<b>Seniors</b>



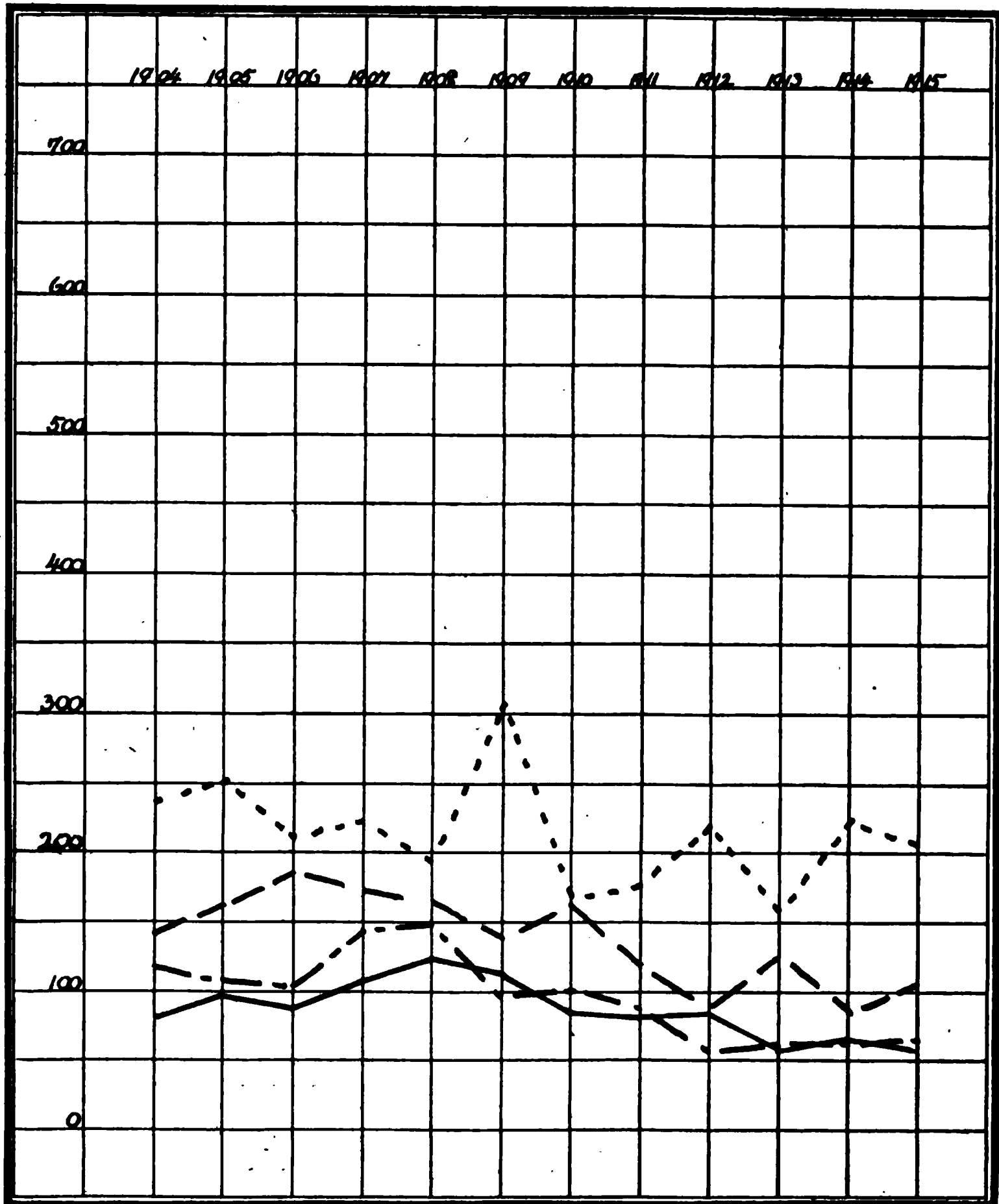


DIAGRAM III

Showing the registration from year to year in the classes of the West Side School. Classes are distinguished as in earlier diagrams.

Diagram IV is for the Manual Training High School. The great fluctuations in the first two years go a long way toward explaining the characteristics of Diagram I, in which all of the schools are included. Diagram IV proves, without any reference to the history of the course of study for successive years in that school, that the policy of the school has undergone great changes.\* As a record of instability of internal organization the diagram is very impressive.

Diagram V is for the East Side High School. The most impressive fact about this diagram is absence of steady growth except at the beginning of the history of the junior and senior classes and the enormous gap in the middle. The first two years are widely separated from the last two years. Furthermore, the first and second years interlock and exhibit a most complicated set of fluctuations. The fact that the general level of all the lines is fairly constant shows that this school is wholly different in its history from the Manual Training High School and from the other schools.

Diagram VI is for the North Side High School. The new building is the explanation of the rise after 1911 in all of the classes. The fluctuations in the first two classes and the small drop between the sophomore and the junior years show that this school is different from each of the other schools.

The careful reader who has had the patience to look at the diagrams will be persuaded that each school has a character of its own. This means that the kind of students who attend each school, the courses which are offered to them, and the method of administering these courses all need to be carefully studied.

It will not be possible in a general report to show the reasons for each characteristic of the various diagrams. It is important, however, that the problems suggested by these diagrams be made subjects of immediate attention by the central administrative officers of the school system, and the recommendation is made that a central high-school conference be organized to take administrative account of the facts here presented and of other like facts which should be collected and recorded each year. It is further recommended that this central council take steps in the direction of a more complete unification of the schools. The East Side High School differs from the others; should it differ as it does? The North Side High School with its new building is an important problem for the whole city. The West Side High School is in need of study. The new principal of the school should be brought into contact with a central administrative body which will bring that school into the system and turn its development in the direction in which the other schools are moving.

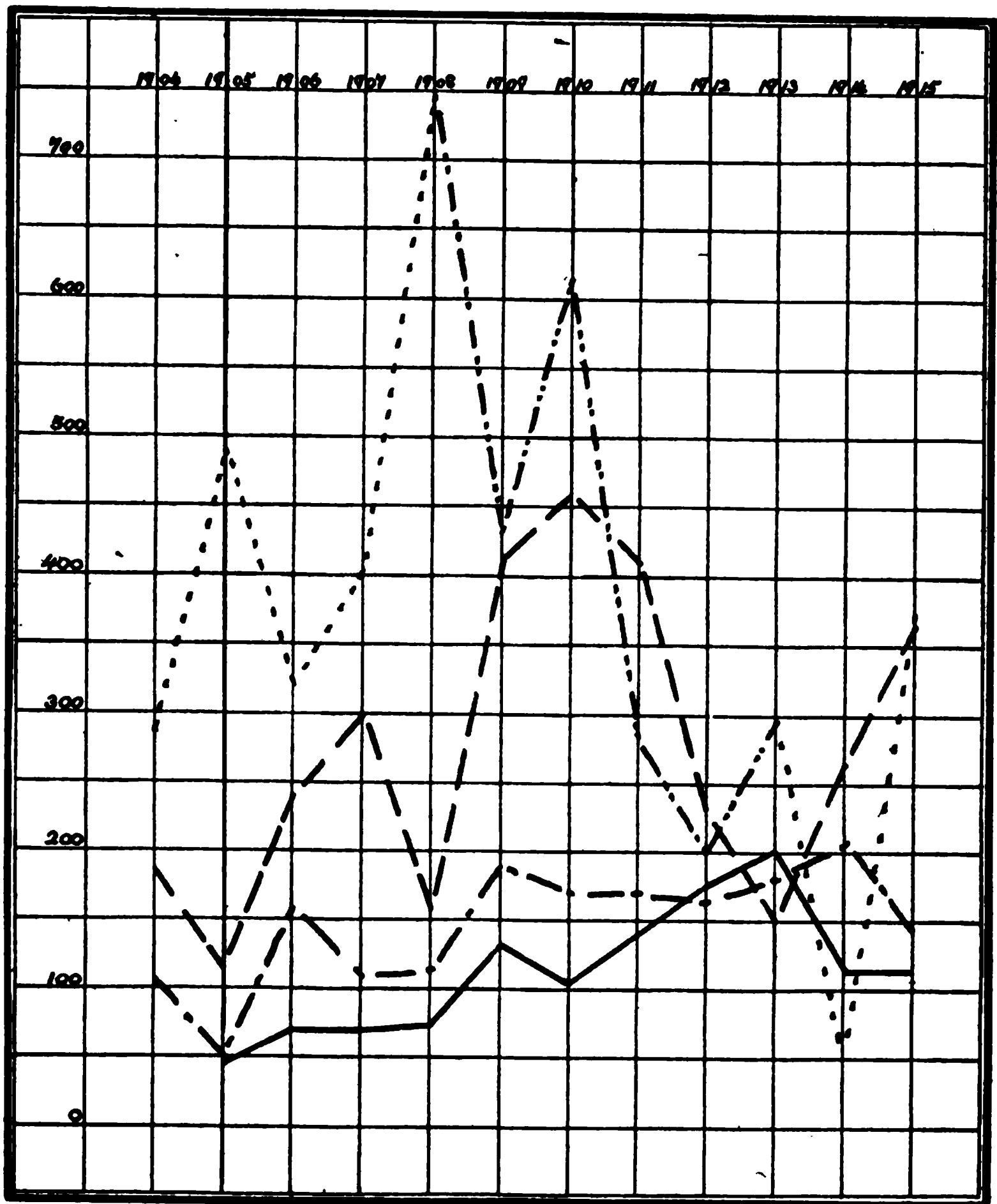


DIAGRAM IV

Showing the registration of the classes in the Manual Training High School and between 1909 and 1913 the freshman class in the Longfellow School. The Longfellow registration is distinguished by that portion of the line for the freshman class which is drawn with a dash and two dots. Otherwise the classes are distinguished as in earlier diagrams.

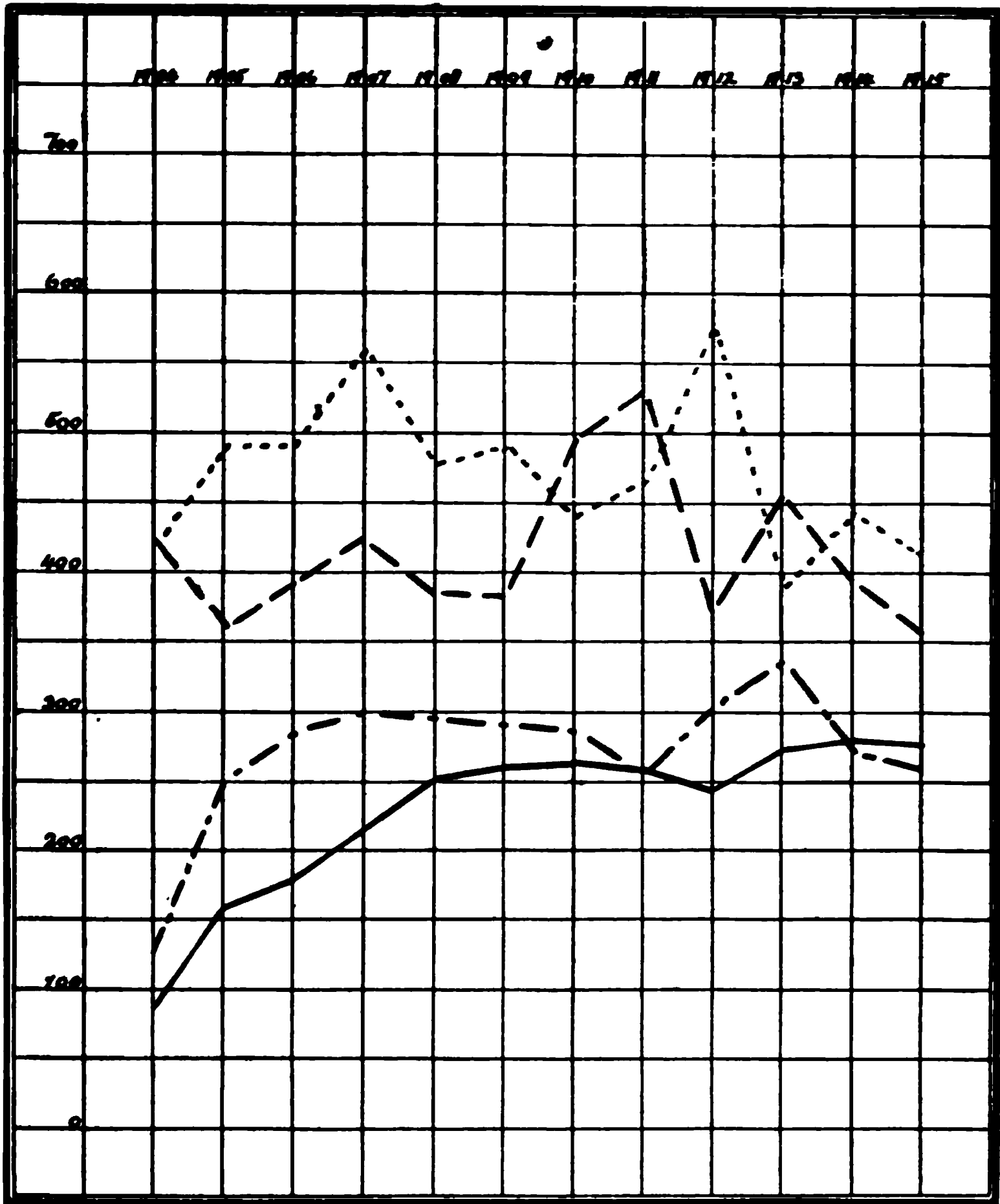
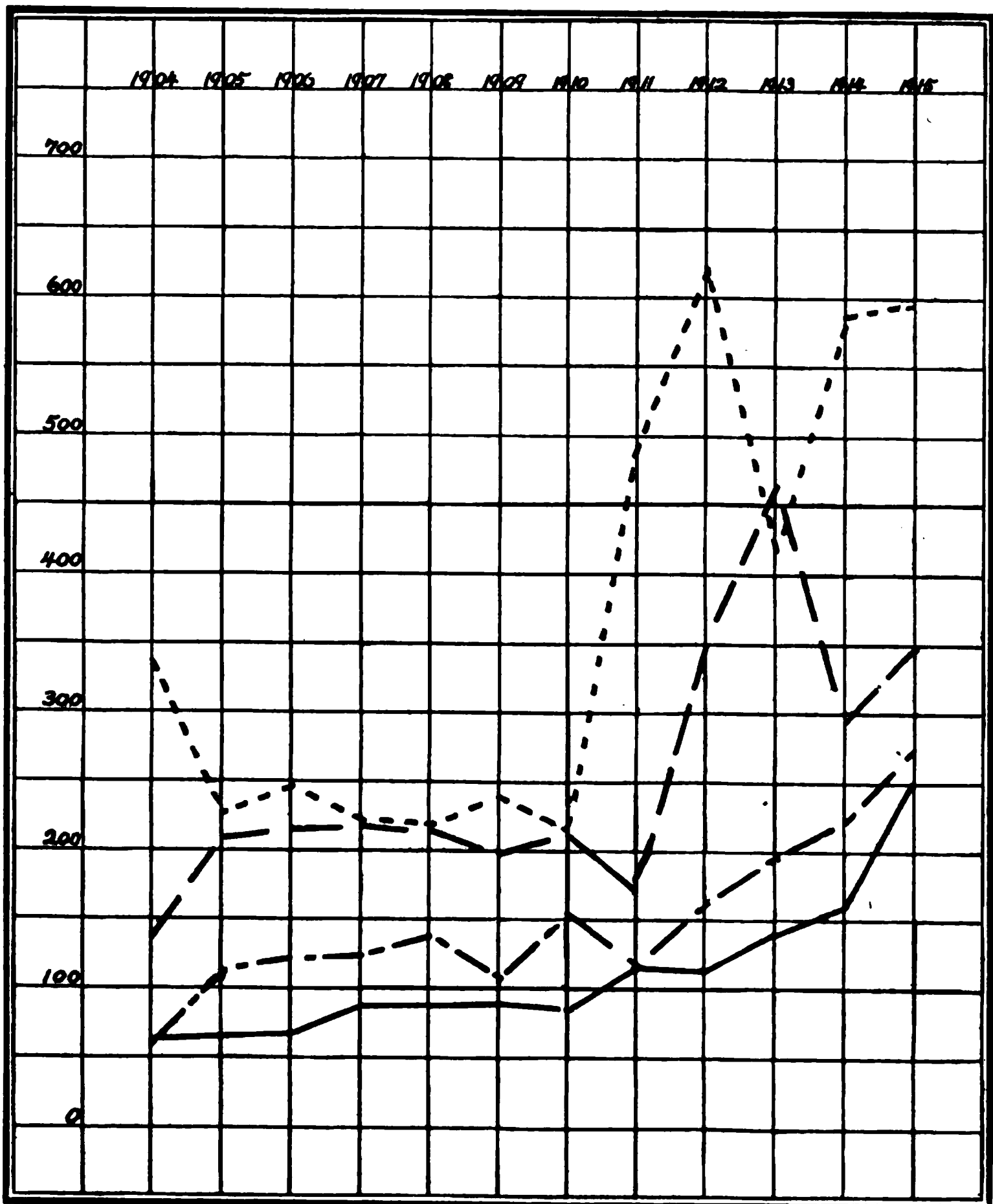


DIAGRAM V

Showing the registration of classes in the East Side School. Classes are distinguished as in earlier diagrams.



**DIAGRAM VI**

Showing the registration of classes in the North Side High School. Classes are distinguished as in earlier diagrams.

Especially important is it that attention be given to the first two years. Students are evidently being dropped out in these years at a rate which proves that there is maladjustment between the courses and the needs and capacities of the students. Some light can be thrown on these problems by looking into the internal organization of the schools.

### **The Success of Students in Courses**

A second body of facts regarding the different high schools is to be found in the records of student failures in each of the courses. Table II presents percentages of failures for the chief courses in each of the

TABLE II

	East High School		North High School		South High School		West High School		Manual High School			
	1914	1915	1914	1915	1914	1915	1914	1915	1914	1915		
	Jan. June	Jan. June	Jan. June	Jan. June	Jan. June	Jan. June	Jan. June	Jan. June	Jan. June	Jan. June		
English I.....	26	21	19	14	18	15	19	18	37	4	35	31
English II.....	14	14	9	8	12	16	17	11	14	16	20	23
English III.....	12	9	6	5	5	3	0	2	13	18	23	20
English IV.....	14	5	0	1	3	1	10	3	11	9	27	13
Mathematics I.....	23	27	36	35	29	24	26	26	14	44	50	50
Mathematics II.....	25	18	18	19	21	21	21	19	35	27	34	19
Commercial Arithmetic...	27	17	31	15	15	16	17	39	..	..	..	..
Elementary Science.....	14	15	19	6	19	9	11	..	0	5	32	7
Botany.....	7	25	8	20	19	14	8	11	..	..	22	24
Physics.....	18	7	22	14	10	15	23	17	44	55	36	34
Chemistry.....	2	3	9	11	0	4	22	11	13	17	14	20
Physiography.....	..	13	12	10	19	15	..	14	..	..	..	..
History—												
Ancient.....	15	19	20	14	13	17	11	5	14	11	14	10
English.....	20	8	15	14	14	17	11	23	8	9	10	5
Medieval and Modern	7	9	6	8	11	9	6	8	12	11	12	8
American.....	9	27	6	..	9	7	5	..	0	..	6	..
Latin I.....	26	29	25	19	21	16	29	17	33	33	25	40
Latin II.....	21	14	24	24	16	20	15	16	14	17	0	11
German I.....	26	27	26	20	19	15	2	19	6	0	11	5
German II.....	19	19	13	15	2	2	7	15	10	10	2	0
Typewriting.....	..	..	19	16	9	18	9	14	7	7	5	8
Stenography.....	11	0	12	3	4	11	7	8	6	6	16	14
Freehand Drawing I.....	33	21	2	7	3	3	..	..	..	..	11	31
Freehand Drawing II.....	19	16	0	0	0	0	0	5	3	2	16	17
Mechanical Drawing I...	26	10	8	6	8	7	12	6	12	14	6	25
Sewing.....	..	..	8	6	7	4	..	..	..	..	7	0
Cooking.....	..	..	6	0	2	4	..	..	..	..	1	4
Forging I.....	..	..	..	..	..	..	..	..	..	..	22	7
Forging II.....	..	..	..	..	..	..	..	..	..	..	24	13
Forging III.....	..	..	..	..	..	..	..	..	..	..	24	13
Forging IV.....	..	..	..	..	0	0	..	..	..	..	22	23
Forging V.....	..	..	..	..	..	..	..	..	..	..	7	6
Forging VI.....	..	..	..	..	..	..	..	..	..	..	7	8



schools for a period of two years. This table should be read as follows: The uppermost figure in the left hand corner of the table is 26. This means that 26 per cent of the students in the class in freshman English failed in the East Side High School in January, 1914.

If one looks along the uppermost line of percentages, he will be impressed with the fact that the West Side High School fails relatively few freshmen in English while the East Side High School and the Manual Training High School show in almost every report failures which range from a quarter to a third of the class.

A little further down in the table one finds the reports for freshman and sophomore mathematics. These figures for mathematics raise very pointedly the question: Should algebra be required of all freshmen? If an instructor has to fail from 16 per cent to 50 per cent of his class, who is to blame?

The time was when the people and the students looked on the high school as an institution which selected certain people for a higher education and said to others that they could not be admitted to the higher intellectual life. It was thought to be a mark of high efficiency in the school to fail a large per cent of the students. The day has come when people question a course which cannot pass more than 70 or 50 per cent of the students. Algebra must make a better case for itself than now seems possible if it is to be kept in the curriculum as a required subject in freshman year.

It should be noted that a requirement of algebra of all freshmen makes this course not merely a prerequisite to later mathematics courses but also a prerequisite to all of the courses in the junior and the senior years. If a student fails in algebra, he cannot take the later courses because algebra is a freshman requirement. The gap in the diagrams given above between the freshman and the sophomore years begins to receive its explanation.

One general suggestion which is appropriate at this point is the suggestion that supervised study be introduced. Many students fail, especially in the first year of high-school work, because they do not know how to get their lessons. Assignments are very frequently made without sufficient specific directions as to the method of attacking the work assigned. In general, it is better, especially in the early years of the high-school course, that students do their studying with the instructor. It is advantageous for both students and instructors that such an organization be worked out. A variety of different experiments are being tried in different parts of the country. In some cases a double period is allowed for a single subject. In others, the periods of the school program have been somewhat extended to allow time, in addition to the usual recitation, for a period of supervised study.

In some cases a particular period in the day has been set aside for conferences between instructors and students. In any case, this means an investment of time and energy on the part of the teaching staff, but the returns which come in the classwork and in the effectiveness of instruction amply repay the system for undertaking this additional work. Experiments in supervised study have been made in many progressive schools in the effort to meet the difficulty in regard to freshman algebra.

The figures given in Table II show clearly the differences in internal policy between the various schools. Throughout all subjects the number of failures is small in the West Side High School. The North Side High School records more failures in mathematics than the East Side High School, while the East Side High School has more in English and Latin than does the North Side High School. The Manual Training High School is very high in almost every subject, but relatively low in German.

These differences show that there should be a closer study of the policy of these schools and of their various departments. The impression one gets from this table is of a scattered group of teachers, each working without reference to central standards. This impression is confirmed by examination of the schools in detail. The teachers in one school usually do not know what is going on in other classes in the same school, and they know still less about what is going on in other schools.

In the early stages of the survey the suggestion was made that changes be introduced in the organization of the faculties so as to provide for the development of standards. This suggestion was acted on in the department of mathematics in the North Side High School. Principal Brown supplies the following memorandum of the results of this departmental organization:

#### **"MEETINGS OF THE TEACHERS OF THE MATHEMATICS DEPARTMENT, NORTH SIDE HIGH SCHOOL.**

##### *"Plan of Organization.*

"The teachers of mathematics were called together by the principal, who appointed one of the group to act as leader.

##### *"Time of Meetings.*

"It was decided by vote of the teachers that they would meet for 45 minutes one day each week at the close of school.

##### *"Purpose of the Meetings.*

"To improve and unify the work in mathematics. A free discussion of conditions pointed out the features of the course that needed strengthening. It was decided that wherever a weakness was recognized some plan approved by the majority should be tried by all for

improving that condition. No one better than the teachers themselves knows these weak places.

"Later the results of these efforts will be compared and the plan adopted will be approved or modified as conditions may suggest to be advisable.

"One of the greatest advantages to the teachers of the department meeting is the opportunity it affords for unifying the work. A minimum amount of work that should be accomplished in a definite period was decided upon. Frequent comparison of the progress was made. At the end of the quarter all classes had covered the same topics.

*"Definite Work Accomplished.*

"The course in first year algebra has been critically considered, not only because it is the first subject in the course, but because of the great mortality there.

"The text book has been analyzed. Every subject has been considered as to its relative importance and the degree of emphasis it should receive.

"A tabulated statement has been made of those exercises and principles which should be omitted, passed over lightly, or emphasized.

"This syllabus will be mimeographed or printed and kept for future reference. It is hoped that it may be of assistance to any new teacher coming into the department.

*"Miscellaneous Results.*

"Teachers in the department have exchanged visits.

"An appreciation of the work being done by other teachers has been fostered.

"Inspiration has been received and enthusiasm has been developed. A teacher realizes that his difficulties are not peculiar to himself but an educational problem worthy his best efforts in trying to seek a solution.

"A uniform style of arrangement for written work in geometry and for all examination papers has been decided upon.

"The records of pupils taking freshman mathematics at institutions of higher learning have been reported to the entire group, and an opportunity has been made to express to those pupils who are carrying their advanced work with credit the commendation of their former teachers. This suggested to the teachers in the department that they make inquiry of each other concerning the standing of the pupils they had the past term. This furnishes a splendid test applied by the teacher himself to determine his own efficiency."

It is recommended that departmental organizations of this type be developed in all of the schools and that arrangements be made to bring the departments in different schools into close contact with each other.

## Course of Study

The methods of examining the course of study which were adopted by the survey were as follows: First, each school was visited by the writer of this report, and class sessions in each of the divisions of the school's work were attended. Incidentally, the opportunity was thus secured of gathering from a word with many of the teachers their views regarding the purposes of the various courses and their judgments as to the wisdom of imposing on students the various requirements. Second, conferences were held during the period of visiting the schools with each of the principals. These personal conferences were extended in two full conferences of all of the principals called by Dr. Smiley at which the course of study and other matters of organization were discussed in the light of a tentative report of the suggestions which are here reported fully. Third, the registration of students in all the classes of each of the schools was collected from the records. Fourth, the development of the course has been studied in terms of the various reports and printed outlines available in the Superintendent's office.

The line of evidence which is entirely free from personal bias of any kind is that to which reference is made under method three. For purposes of exposition this impersonal evidence will be presented first.

The registration of the various schools in 1914-15 was as follows:

East Side High School.....	1,389
North Side High School.....	1,264
Manual Training High School.....	634
South Side High School.....	454
West Side High School .....	437

TABLE III

East Side High School	Manual Training High School	52 to 103
318 or more	145 or more	Latin I
English I	Geometry	Freehand Drawing II
Algebra	Algebra	Typewriting
Ancient History	Mechanical Drawing II	Modern and Medieval History
English II	Freehand Drawing I	English History
159 to 317	72 to 144	English IV
Geometry	Freehand Drawing II	Botany II
Latin I	English I	
English IV	English II	West Side High School
Freehand Drawing I	Physics	100 or more
Mechanical Drawing I	Joinery I	Typewriting
English III	Mechanical Drawing I	Algebra
Physiology III	English III	English I
Physics	English IV	Ancient History
English History	Pattern Making III	Mechanical Drawing I
	Cooking II	English II
North Side High School	Ancient History I	
290 or more	Civics IV	50 to 100
Algebra I	Botany II	Geometry
English I	Spanish III	Freehand Drawing II
Ancient History I		English IV
Mechanical Drawing I	South Side High School	Physics
Freehand Drawing I	104 or more	Stenography and Type-writing
145 to 289	Mechanical Drawing	German
Geometry	Algebra	Modern and Medieval History
English II	Ancient History	Bookkeeping
English History	English I	English III
Latin I	Geometry	Botany
English III	English II	
Typewriting		
Physics		

If the distribution of students into courses in the various schools were exactly of the same pattern, then any course registering 100 students in the West Side High School would have 104 in the South Side High School, 145 in the Manual Training High School, 290 in the North Side High School, and 318 in the East Side High School. Likewise, a course which registered 50 students in the West Side High School would have the following numbers in the other schools: South Side High School, 52; Manual Training High School, 72; North Side High School, 145; and East Side High School, 159. Taking these two sets of figures as lower limits, we may ask for each school what courses register more students than the upper limit and what courses register more than the smaller limit but less than the larger. The result is shown in Table III.

An examination of the table shows that algebra is, in point of number of students registered, the strongest single subject in the curriculum of the Denver schools. Comment has been made at length on this subject in an earlier chapter. It is undoubtedly an unnecessary stumbling block in the path of many students. Some schools in the United States have reduced greatly the failures in this subject by

putting it in the sophomore year rather than in the first year. Some schools have radically changed first year mathematics and have emphasized geometry and the simpler principles of algebra. Some have removed it from the required list altogether. Denver is strongly conservative in its insistence on algebra as the course most largely taken in the high-school system as a whole.

English I and Ancient History vie for second place. Ancient History is required of every academic student and is taken by many students in the Manual Training High School. This emphasis on Ancient History is a remnant of the classical tradition. The course is defended now by saying that the student ought to begin his history with the ancient period in order to understand modern history. Again, it is said that ancient history contains more cultural material than other periods. It is thus an introduction to literature, biography, etc. Over against these contentions is the painful fact that students do not know modern American institutions and are woefully ignorant of the European background of United States history.

It is recommended that the requirement of ancient history be abandoned at once and that courses in community civics and modern history be emphasized in place of ancient history.

English has become intrenched in the high-school courses of the United States in recent years to an extent which fully justifies the Denver schools in the emphasis which they lay on these courses.

It will not be out of place in this connection to call attention to the imperative need of more attention to good forms of expression in classes other than the English classes. In Denver, as elsewhere, there are indications that good expression is often neglected in other classes of the school and the English classes are devoted to a formal study of the facts about style rather than a cultivation of the power of expression.

The emphasis on drawing and commercial subjects which appears in Table III opens up a large general problem which has to do not only with the curriculum but also with the whole organization of the schools. It is evident that these courses are regarded in the schools as important for a general education. Since tradition is not responsible for their place in the schools, it is probably legitimate to infer that the large registration, at least in the commercial courses, is due to a desire on the part of the students for the kind of practical training which they give.

The question now before the school authorities is this: Shall practical courses, especially in commercial subjects, be a part of the program of every school, or shall special schools be erected to accommodate special interests? At the present time there is much discussion about the desirability of erecting a commercial high school.



It was pointed out in an earlier chapter that the tendency in many school systems in the United States is toward the development in each school of a broad, inclusive course of study. The so-called cosmopolitan high school like that on the North Side offers all of the different types of courses to all of its students.

It is doubtful whether the demand for commercial courses could be met under one roof. Typewriting appears as a major demand in three of the programs presented in Table III. It would curtail the work of the city greatly to thus erect a school which would tend to deprive the students in other schools of these opportunities. Furthermore, the example of the Manual Training High School makes it evident that there would be an immediate demand for a broad curriculum in a special school if it were established. The program of courses shown for the Manual Training High School in Table III shows that a general program of studies is the only one which will satisfy students.

The argument can be put into very concrete form by considering the case of a student who is now a member of the large course in typewriting in the South Side school. If such a student had to consider the alternative of a long trip to the center of the city or the taking of a course in the South Side school in which typewriting would be omitted, it is not unlikely that he would feel that he must omit the typewriting.

Commercial courses are not expensive in their equipment. It is cheaper for the community to give the courses in many different centers than to make the individual students carry the expense of going far from home to secure the courses.

In short, the community ought to offer to each student as much work as it can afford to offer at points as easily accessible as possible.

There are some kinds of equipment so expensive that courses using such equipment must be concentrated. It is probably true that technical work in metal machine courses must be concentrated in one place in a city of the size of Denver. The argument ought hardly to be pushed so far, however, as to include all manual training courses in this arrangement of concentration. Manual work is so useful as a part of a general education that it ought to be offered at every center.

The various centers ought to be large enough to make possible the offering of such a full rich course. At present the West Side school and the South Side school are too small to be economical centers for the full course. The city is content for the moment to adjust matters by leaving these schools without many of the opportunities that they should have. The wise step in high-school construction would be to make out of these two schools one consolidated cosmopolitan school. Such a type of school would give the south and west sections of the

city what the north section now has. When the East Side school is rebuilt it should be of the same cosmopolitan type. Such a building program as this would serve the city better than the erection of another special school. As already pointed out, the Manual Training School is aiming to broaden its curriculum. Another special school would do the same, tending to sap the life of the other schools through competition. The system as a whole will profit by an adoption of the cosmopolitan plan.

The foregoing paragraphs which have dealt with the particular courses of study must be supplemented by a brief discussion of broad, general principles. The chief difficulty in the Denver schools at the present moment is not merely that they require ancient history to excess and require algebra and then fail from a quarter to a third of all the students who take the subject; the chief difficulty is that the course of study is a series of compromises. Tradition and personal opinion and the limitations of equipment have all operated in their degree to determine what shall be taught and required. There is no commonly accepted principle in the minds of the teaching staff or of the principals on which a high-school curriculum should be based.

It is the belief of the writer of the present report that the officers of the Denver system would greatly improve the curriculum if they would institute a series of conferences and reorganize the whole system of requirements. The report of the committee of the National Education Association presented in 1911 (see report for 1911, pages 559-575) would serve as a suitable starting point for such a revision.

There are two broad principles of curriculum organization set forth in that report. A student ought to be introduced in his high-school curriculum to all the great fields of human experience. This is the principle of distribution. The second principle asserts that the student should be required to pursue certain subjects far enough to become thoroughly conversant with advanced types of reasoning. This is the principle of sequence. If these two principles are incorporated into the requirements of a school, the arrangement of particular courses can be safely left to be determined by the individual needs of the students expressed in their elections of courses under careful guidance.

## Vocational Guidance

To the better organization of the curriculum should be added a more comprehensive system of advice to students. Whether one describes this advice as vocational guidance or as supervision of election of courses, it is indispensable in the present complex state of high-school work.

## Methods of Instruction

The recommendations which are imbedded in the foregoing discussion of the course of study ought to be reinforced, perhaps, by reference to the problem of the methods of instruction. Like all schools everywhere in the world, the Denver high schools exhibit the contrast of good and poor teaching in the same building. There is no way of eliminating absolutely from a great system of schools inferior instruction. There are, however, possibilities more than have been realized in Denver of organizing supervision so as to stimulate better teaching. There are evidences of lax organization in some of the schools. The daily program is inaccessible. The records are remiss. The teachers have not been brought to realize in all cases the imperative necessity of careful preparation and prompt and economical methods of presentation. There is good teaching in many classes which would furnish the best possible basis for a requirement of like good work in neighboring rooms.

The recommendation that departmental organization be developed is here reiterated in the interests of a more general development of that which is best in the schools. Departmental organization would reinforce supervision at the point where supervision is now weakest, namely, in the development of the highest and most efficient methods of teaching.

## IV

**RELATIONS BETWEEN THE HIGH SCHOOLS  
AND THE ELEMENTARY SCHOOLS**

Students enter each of the high schools of Denver from a large number of elementary schools. In passing from the elementary school to the high school the pupils experience a change which influences in many important ways their school work and their companionships. The pupil leaves a small eighth-grade class and mixes with the representatives of many other elementary schools in a large freshman class. The subjects which are offered in the high-school course of study differ very radically from those that are offered in the upper years of the elementary school, and the methods of instruction are often very different. Unless the teachers in the high school and the elementary school study each other's problems with a good deal of care there is danger that the pupils will suffer because of a lack of adjustment between the two schools.

At the present time little effort is made in most schools to study the problem outlined in the last paragraph. A few examples will be supplied in this chapter of studies which it would be profitable to carry much further than it is possible to carry them for the current year. The information here tabulated was collected on cards which were distributed to all of the schools of Denver. The elementary schools were asked to record the standing of each of the eighth-grade pupils who completed the course in 1915. The high schools were asked to record the standing of the same students during the first half-year of their high-school work. The two groups of eighth-grade students thus recorded included those who left the elementary schools in January, 1915, and those who left in June, 1915. These two sets of eighth-grade students entered the high schools of the city in February, 1915, and September, 1915. Some differences appeared between the two sets of cards, but in the main they corresponded closely enough to make possible a productive comparison.

The first item of importance is found by comparing the standings of the various eighth-grade pupils with each other. All of those who completed the work of an eighth grade in a given elementary school were distributed into three equal groups. One of these three groups was made to include the highest third of the class in scholarship marks in the eighth grade. The next group, consisting also of one-third of the class, included those who had medium marks in their elementary-

school work. Finally, the third group in the class was made up of those who had the lowest standing in their elementary-school work. The following table and figures show the percentages of pupils from each of these three divisions of the eighth grades of Denver who went to high school. Table IV should be read as follows: Of the highest third of the class completing the eighth grades of the city in January, 67 per cent went to high school; 65 per cent of those completing the eighth grades in June went to high school. From the middle third of the eighth grades 59 per cent went to high school in each case. From the lowest third of the eighth-grade classes in January 56 per cent went to high school, and only 47 per cent in June went to high school. Diagrams VII and VIII present the same results in

TABLE IV

	Highest Third	Middle Third	Lowest Third
January . . . . .	67	59	56
June . . . . .	65	59	47

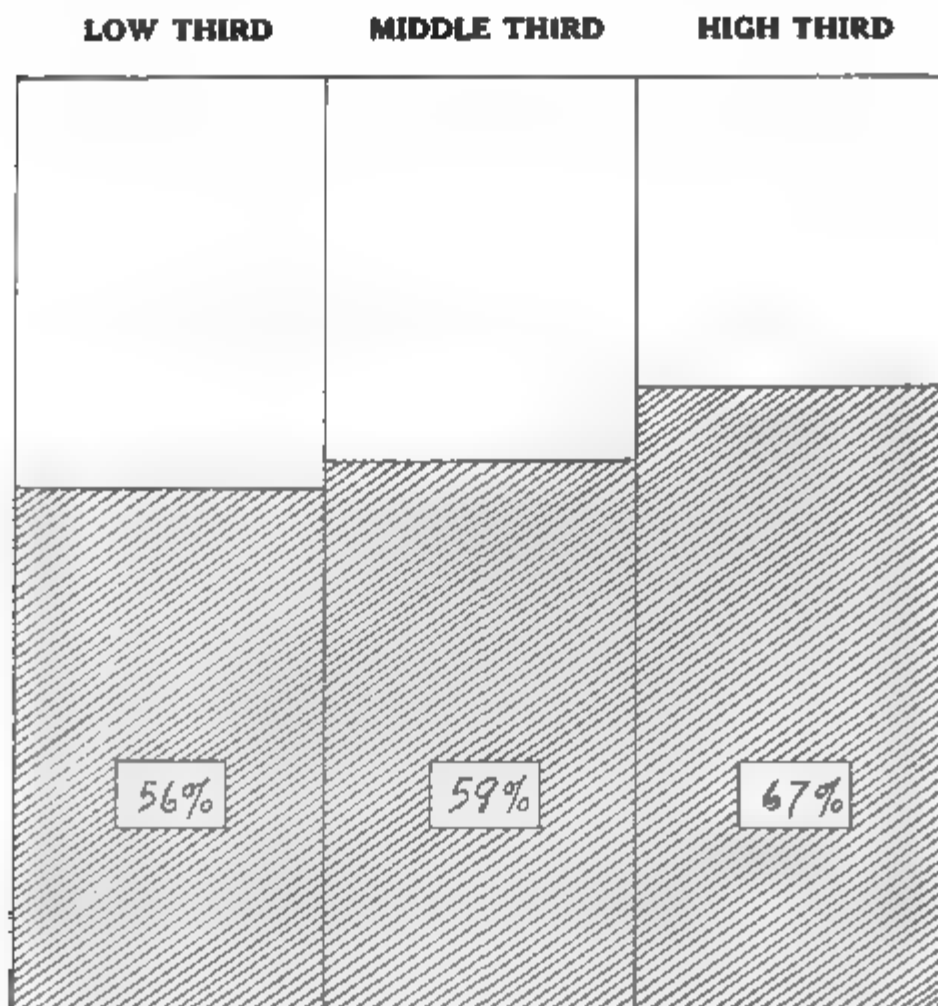


DIAGRAM VII

Diagram VII shows the proportion of pupils from each scholarship division of the eighth grades who entered the high schools. The highest third of the class in scholarship, the middle third, and the lowest third are represented in the sections of the figure. The cross-hatched portions show the proportions going to high schools in January, 1915.

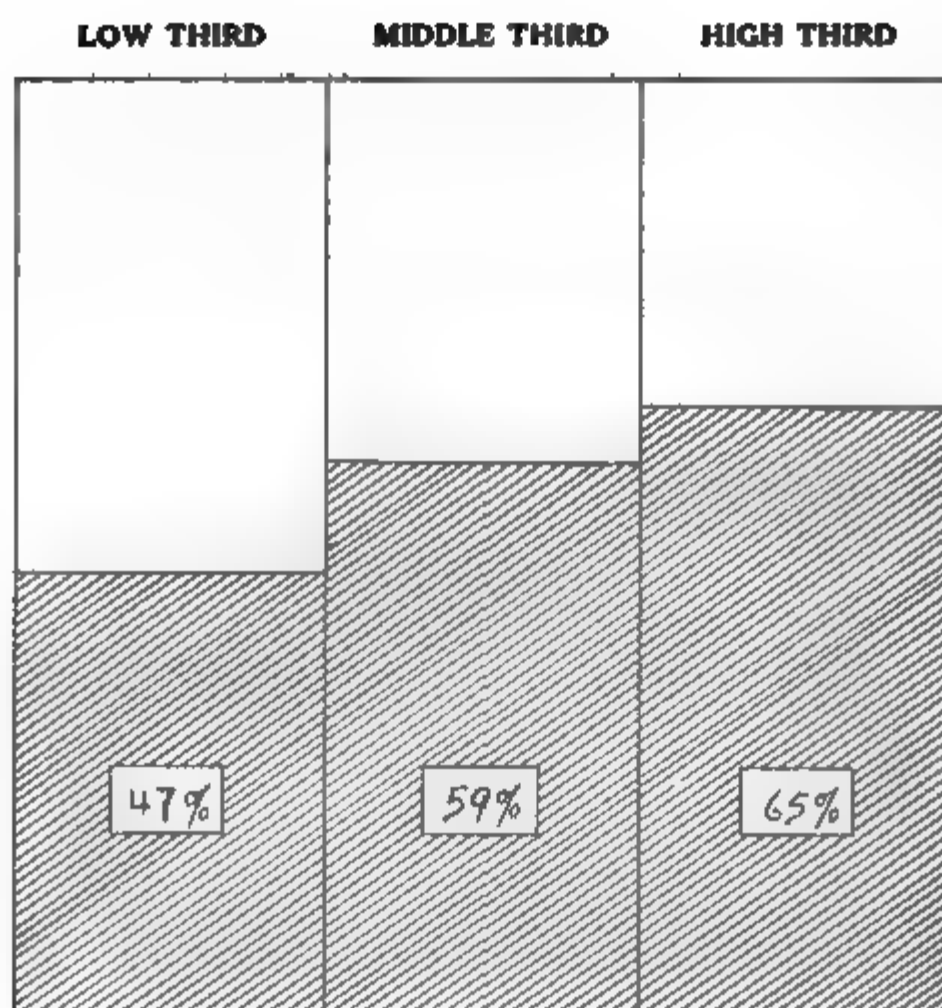


DIAGRAM VIII

Similar to Diagram VII and shows facts for June, 1915.

graphic form. This shows very clearly that students who stand low in their elementary-school work go on to high school somewhat less commonly than do those who stand well in the elementary school. This is partly due to the fact that teachers encourage the brighter pupils to go on into the higher schools. It is also due to the fact that the family of a child who is doing well in the elementary school is likely to be willing to make a sacrifice, if necessary, to keep him in high school.

The economic conditions of the family turn out to be a matter of a good deal of importance in determining whether a child shall go to high school or not. Table V was prepared by securing on the elementary-school cards information with regard to the economic conditions of all of the families of eighth-grade elementary-school children. A rough classification was attempted and the elementary-school principals were asked to distinguish between those children who belonged to families that were distinctly well-to-do and those who belonged to families in fair economic conditions and those who belonged



to poor families. A total of 1,807 cards were secured from the elementary schools. One thousand fifty-three of these cards were for pupils who went on into the high school; 754 were for pupils who completed the work of the eighth grade but did not go on to high school. The distribution of these two groups of children in the three categories above described is presented in Table V. This table shows very clearly that favorable economic conditions at home and attendance on high school are related.

TABLE V

	Well-to-do	Fair	Poor	Unclassified
Total .....	237	1,071	456	43
Per cent entering high school	76	65	35	48

Incidentally, it is worth noting that the economic condition of the children is also related to the character of their scholarship in the eighth grade. Of the 237 who were reported in all the eighth grades as coming from well-to-do families, 43 per cent stand in the highest third of the eighth-grade classes to which they belong. From the poor families only 25 per cent stand in the highest third of the eighth-grade classes. The other figures in Table VI bear out this general contrast.

Perhaps greater emphasis should be laid on the fact that so many children from poor homes do well in their studies and go to the high school. Evidently there are boys and girls who overcome the handicap which their class as a whole exhibits. The small percentage of poor children who go to high school shows the importance of social environment in educational matters; the fact that there are any children from the poorer classes in the high schools shows how broadly democratic that institution has become.

TABLE VI

	Well-to-do	Fair	Poor	Unclassified
Highest Third .....	43	33	25	23
Middle Third .....	29	33	37	41
Lowest Third .....	29	33	38	36

The different elementary schools send on to the high schools very different proportions of their classes. A few examples will illustrate the meaning of this statement. Table VII and Figure IX report the details with regard to six of the large elementary schools. It will be seen that the Ashland School sent, in September, 1915, more pupils from each of the upper two-thirds of the class than from the lowest third. On the other hand, the Edison School sent more from each of the lower two-thirds than from the highest third. The Hyde Park School and the Park Hill School are to be contrasted because of the relatively large number of the Park Hill pupils who go to high school and the relatively small number of those who go from Hyde Park.

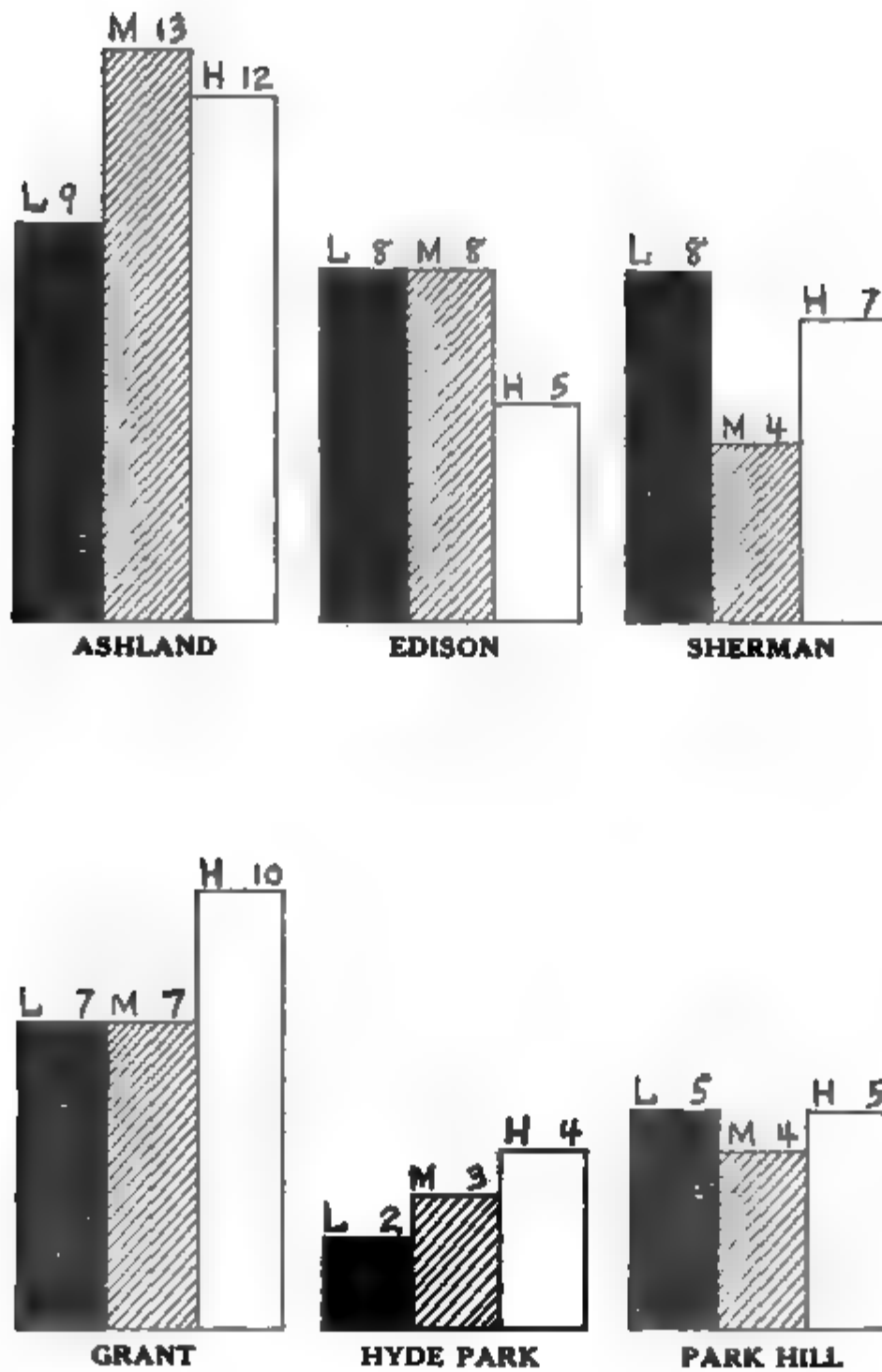


DIAGRAM IX

Diagram IX shows the actual number of pupils who went to high school from the various scholarship divisions of the eighth grade in six large elementary schools.

TABLE VII

	No. of Graduates	Entered High School		
		Highest Third	Middle Third	Lowest Third
Ashland . . . . .	55	12	13	9
Edison . . . . .	38	5	8	8
Sherman . . . . .	32	7	4	8
Grant . . . . .	32	10	7	7
Hyde Park . . . . .	27	4	3	2
Park Hill . . . . .	17	5	4	5

Table VIII shows the percentage of pupils in each third of each of the eighth grades reporting, who went to high school. Such a table as this indicates more fully for the whole city the different types of relationship between elementary schools and high schools.

The reasons why the different elementary schools stand in such different relations to the high schools can be found in part in the economic conditions of the different sections of the city. There is also undoubtedly a close relation between the course of study in the elementary schools and the consequent encouragement given to pupils to go on. Every elementary school has an obligation to the city to encourage pupils to make the most of the opportunities offered in the public schools. Perhaps the elementary schools are making adequate efforts at the present time. In that case the records in Table VIII are a true index of the extent to which pupils should go beyond the eighth grade. If, on the other hand, some elementary schools are not doing as much as others, a detailed comparison is made possible by means of the figures in the table.

TABLE VIII

	January			June		
	Highest Third	Middle Third	Lowest Third	Highest Third	Middle Third	Lowest Third
Alcott .....	29	19	19	13	13	21
Ashland .....	22	17	12	22	24	16
Berkeley .....	16	16	16	23	23	7
Boulevard .....	33	17	17	17	17	10
Bromwell .....	..	..	..	10	25	25
Bryant .....	14	18	14	28	14	10
Byers .....	25	17	8	18	6	18
Central .....	17	17	5	13	0	0
Cheltenham .....	31	24	24	22	26	19
Columbian .....	28	22	22	24	24	14
Columbine .....	15	15	5	25	34	16
Corona .....	15	26	21	27	25	22
Ebert .....	20	0	20	15	15	11
Edison .....	18	24	18	13	21	21
Elmwood .....	13	19	0	17	17	6
Emerson .....	25	19	31	32	28	13
Evans .....	22	16	22	23	26	20
Franklin .....	19	13	6	24	19	8
Garden Place .....	..	..	..	11	7	4
Gilpin .....	13	13	31	29	25	14
Gove, Aaron .....	25	31	25	18	24	24
Grant .....	25	35	25	31	22	22
Hyde Park .....	14	0	21	15	11	7
Lincoln .....	28	28	31	25	28	18
Logan .....	25	25	25	27	18	18
Mitchell .....	17	22	4	17	11	14
Milton .....	20	40	40	18	36	27
McKinley .....	29	24	12	19	31	6
Montclair .....	..	..	..	30	10	20
Myrtle Hill .....	..	..	..	30	35	30
Park Hill .....	25	31	31	29	24	29
Sheridan .....	..	..	..	0	14	14
Sherman .....	0	30	20	22	13	25
Smedley .....	27	7	20	20	10	20
State Home .....	..	..	..	25	0	13
Twenty-fourth Street .....	..	..	..	21	26	11
University Park .....	..	..	..	30	40	30
Valverde .....	..	..	..	6	18	18
Vassar .....	..	..	..	8	17	17
Villa Park .....	7	21	7	15	15	3
Washington .....	..	..	..	22	0	11
Whittier .....	24	21	21	22	13	15
Wyman .....	20	35	30	23	32	26

One group of facts which ought to be studied further will help at once to explain the differences shown in Table VIII and at the same time suggest the kind of work which other schools should consider. The course of study as administered in the various elementary schools of the city differs in several important respects. In order to bring out these facts of difference between the various elementary schools a series of questions were submitted to each elementary-school principal. Fifty-six sets of replies out of a possible sixty-five were received. In forty-one of the fifty-six schools reporting there is in the seventh and eighth grades more or less departmental teaching, that is, teaching by teachers who devote their whole time to a limited range of subjects. Sixteen of these schools have departmental organization of instruction in one or more such subjects as nature study, art, penmanship, manual training, etc., even down to the fourth grade. The fact that some schools, on the other hand, do not departmentalize their work was stated with emphasis by principals who do not believe in departmental work even in the upper grades.

This is a matter of importance in discussing the relation of elementary schools and high schools. The student who attends a school which is fully departmentalized is prepared to face without serious readjustment the high-school organization where departmental instruction is the universal practice. The child who has been trained in an elementary school where there is no departmental teaching finds in the high school a strange and often confusing method of passing from class to class and teacher to teacher.

Some of the elementary schools give courses that are higher than the ordinary elementary course. Thus, 19 out of the 56 reporting have some algebra in the eighth grade; eight have algebra down as low as the seventh grade. Three schools have some geometry in the upper grades. In ten schools there are pupils studying German with a total registration in the sixth, seventh, and eighth grades of 346, 275, and 181, respectively. Fifteen schools have some commercial courses; three report typewriting, one a commercial department; five report courses in business forms, and thirteen some work in bookkeeping. In manual training and nature study there is a variable but widespread tendency to give courses.

It may be questioned whether all these additional courses are well advised. For example, we have seen in an earlier chapter the difficulties attaching to algebra courses in the high school. The question arises, in view of the statements in the last paragraph: How far ought such work to be attempted in elementary classes?

The answer to this critical question cannot be found in a mere denial of the right of the lower school to expand. The variations which are being adopted in the work of the elementary schools are a part of a general movement apparent in many parts of the country

toward an enrichment of the common schools. The high school has grown steadily in recent years. The elementary school is no longer the limit of education for even the common boy and girl. The boys and girls are all looking forward to higher courses. This being the case, there is an increasing desire on the part of the brighter pupils to begin higher work as soon as they are qualified. The boundary between elementary education and high-school education is melting away.

It is a fundamental mistake for eighth-grade teachers to treat elementary courses in such a way as to give pupils the impression that they have reached the end of desirable training. In some schools there is such conservatism in the course of study that pupils get the impression that there is nothing beyond. The example of the progressive, expanding eighth grade is the example which should be studied by any school which is sending less than its share of pupils to high school.

It is possible from the records collected for this study to answer one objection which is often raised to an expanding course of study. It is said that children ought to mature slowly, that they ought not to be given higher work when they are young. The facts all point in the other direction. Table IX shows the distribution of the children in the various divisions of the elementary classes. From this table it appears that the better pupils are on the whole younger than the other groups, and the least efficient pupils are the oldest. This table can be explained in part by pointing out that pupils in good health, with good natural ability and good home conditions, go through the grades more rapidly than pupils who encounter adverse conditions. This explanation does not, however, negative in any way the conclusion that younger pupils can do work of a superior type. There is no justification for the argument that mere years are necessary for pupils to mature.

TABLE IX

Age	Highest Third	Middle Third	Lowest Third
Below 12 .....	3	1	0
12-13 .....	38	10	8
13-14 .....	171	124	73
14-15 .....	232	244	191
15-16 .....	97	164	207
16-17 .....	29	55	87
Over 17 .....	6	15	31
Unclassified .....	3	8	10

We turn now to a consideration of the pupils after they pass out of the eighth grade into the high school. We are concerned, first of all, in finding out how the different kinds of pupils distribute themselves in the different high schools. Cards were secured, as stated above, from the high schools giving the names and records of all of the freshmen so that it was possible to break up the groups coming from the different elementary schools and place each child in his proper

high-school class. Table X presents the results for all of the cards secured from the high schools. This table is to be read as follows: In February there entered the East Latin High School 25 students who left the eighth grades from the highest third of the class; 22 pupils entered from the middle third of the eighth grades, and only 9 entered from the lowest third. Evidently this group of students represents a relatively high grade of scholarship from the elementary schools. Six pupils came into the East Latin High School from sources not identifiable on the elementary-school cards that were received, and 21 are wholly unaccounted for on the elementary-school cards. Some of them came from parochial schools. Some came from outside of the city of Denver. It is also to be understood that in collecting the cards from all of the schools in the city some omissions occurred. The table shows clearly how many omissions of this type there are, and indicates also that the larger part of the students in the freshman year of the high school is accounted for. To be exact, between 66 and 70 per cent of the freshmen in the high schools are accounted for in this table, and their standing in the elementary schools is clearly indicated.

TABLE X

	Highest Third	Middle Third	Lowest Third	Outside of Denver	Not Accounted For	Total
<b>FEBRUARY—</b>						
East Latin High School.....	25	22	9	6	21	83
East Side High School.....	6	11	18	10	16	61
North Side High School.....	43	36	32	0	25	136
South Side High School.....	13	18	17	2	8	58
West Side High School.....	12	5	4	0	16	37
Manual Training High School.....	20	26	21	0	25	92
School of Trades.....	1	5	4	0	13	23
Total .....	120	123	105	18	124	490
<b>SEPTEMBER—</b>						
East Latin High School.....	53	30	19	38	48	188
East Side High School.....	27	26	16	17	23	109
North Side High School.....	88	82	76	40	59	345
South Side High School.....	26	28	23	18	15	110
West Side High School.....	24	26	11	6	46	113
Manual Training High School.....	33	48	46	23	44	194
School of Trades.....	1	4	4	3	18	30
Total .....	252	244	195	145	253*	1089
<b>FEBRUARY AND SEPTEMBER—</b>						
East Latin High School.....	78	52	28	44	69	271
East Side High School.....	33	37	34	27	39	170
North Side High School.....	131	118	108	40	84	481
South Side High School.....	39	46	40	20	23	168
West Side High School.....	36	31	15	6	62	150
Manual Training High School.....	53	74	67	23	69	286
School of Trades.....	2	9	8	3	31	53
Total .....	372**	367**	300**	163	377*	1579

\*Sixty of these are reported as entering high school from one elementary school which does not distinguish in its marks between good and poor pupils.

\*\*These figures are 14 less than the totals given in the tables referring to the elementary schools. The 14 pupils went to high schools outside of Denver.



If we contrast the East Side High School freshman class with that which goes to the East Latin High School, we see that the class entering the East Side High School is of an entirely different type from that which goes to the East Latin High School. Both in February and September the East Latin High School includes a heavier percentage of those who come from the highest two-thirds of the elementary-school classes. The kind of pupils entering the other high schools can be seen from the table.

Especially important is the fact that the Manual Training High School has a larger percentage of pupils from the lowest third of the elementary-school classes than any other high school. This is undoubtedly to be explained in part by the fact that pupils who are not interested in the ordinary studies of the elementary school find in the manual occupations which they are offered in the Manual Training High School an outlet for their energies which seems to them much more interesting. They go, therefore, to the Manual Training High School when they would not be willing to go to one of the academic schools.

This table with regard to the different kinds of pupils should be taken in connection with an earlier table (Table II, page 158) in which the failures in different subjects in the different schools were seen to be very different from each other. The differences between the entering classes do not explain all of the differences in the earlier table, but it is important that the typical constituency of the different high schools should be clearly recognized.

The contrasts between the various high schools should not be treated superficially. There is every reason to commend a school which attracts pupils of high grade. But if the school which attracts high-grade pupils is not able to hold them, the condemnation which should rest upon that school for losing its pupils is all the more severe.

Conversely, if a school takes low-grade pupils and so administers its courses that these pupils fail, it ought to be brought to a realization of the fact that it ought to understand its constituency better or the constituency ought to be informed of the failure which awaits the low-grade student if he tries to enter this school.

The duty of this report is performed if suggestion is given of the lines of study which the high-school officers of Denver ought to take up. The clear facts are that the high schools differ. They also lose a great many students in the early years. They record a very heavy failure in many required courses. These facts show that careful study is needed in order to bring about a better co-ordination between the different parts of the school system. The facts reinforce powerfully the arguments which were presented in earlier chapters for a

co-operative study of the high-school problems of the whole city by representatives of all the schools.

Specifically, enough evidence has been furnished in this study of the relation between the high schools and the elementary schools to make it clear that the earlier recommendations with regard to the course of study in the high school should be coupled with a careful consideration of the work of the last two years of the elementary school. There is abundant evidence that the upper years of the elementary school are being modified in many of the schools of Denver so as to bring them into closer contact with the first years of the high school. This reorganization of the upper years of the elementary school should be systematically worked out and should be coupled with improvement of the work in the earlier years of the high school.

Certain of the improvements thus suggested can be achieved most readily by modifying somewhat the organization of the school system. Instead of grouping the seventh and eighth grades with the lower grades, it has been found advantageous to put the seventh and eighth grades with the first year of the high school and organize a new unit within the system. This new unit is called a junior high school or an intermediate school.

There are many forms of this new school. In general, all of the forms aim to bring about an expansion of the course of study in the seventh and eighth grades. In order to enrich the courses of these grades it is economical to combine several seventh grades from various districts and in like fashion to combine the eighth grades. The most expensive parts of the ordinary elementary school are these upper grades. They are always smaller than any of the other grades because pupils have dropped out of school. It is almost impossible to enrich the course with due regard to economy without uniting several seventh grades and several eighth grades with one another.

Where concentration of seventh grades and eighth grades is possible, there is distinct economy and an easy possibility of a better form of organization and teaching.

The junior high school or intermediate school usually includes also the first year of the present high school. An example of the separation of the first-year class from the rest of the high school is to be seen even under the present organization in the East Latin High School. One has only to think of the East Latin High School expanded to take over some seventh and eighth grades and he has the picture, in its externals at least, of a junior high school.

The junior high school has been fully described and defended in current educational writings. Perhaps the best statement of the program of this school can be found in the Proceedings of the North Central Association of Colleges and Secondary Schools for 1916. The proceedings for 1915 also contained a preliminary report on the same subject.

A complete statement of the advantages of the junior high school would extend this report beyond its proper limits. Enough has perhaps been said to show that any device would be justified which would bring the elementary schools and the high schools closer together and the high schools closer to one another in a study of their problems. It may be added that a consideration of the history of American schools (see Bulletin No. 8 of the Bureau of Education, 1916, entitled "Reorganization of the Public School System," by Frank Forest Bunker) shows that our present eight-year school was patterned after a foreign model and has gradually been developing toward a new form of organization. It may be further added that scientific studies of the pupils in the schools show that they change radically in mental attitudes and needs at about the end of the sixth grade. Finally, experience with the reorganized school is most favorable.

The adoption of this plan by Denver is recommended. It is recommended that two elementary buildings be taken over at once for this purpose, thus starting the organization in a limited way. Some redistribution of the pupils would make this possible in several centers which have been studied by the officers of the Denver schools in company with the members of the Survey Staff.

The development of the curriculum for such schools requires a careful study of the better models such as the intermediate schools of Los Angeles, California, and the junior high schools of Grand Rapids, Michigan, and Kalamazoo, Michigan. The principals and teachers selected for this work should be of the highest grade.

In addition to these recommendations with regard to the organization of junior high schools, it is urgently recommended that a system of records be established which shall facilitate the type of study which has been outlined in this chapter. In many school systems in the country a continuous record is being accumulated for each child in the schools. His records throughout the grades appear on this card and the card is transferred with the pupil to the high school. The record shows the character of the student's performances throughout his education. In making a record of this sort that shall be useful, it is important that the elementary school record the pupil's standing not only in

percentages but also in terms of the relative position which he occupies in the class. For this reason it is recommended that the record indicate whether the child is in the highest third, middle third or lowest third of the elementary class. Interesting comparisons are made possible by means of cards of this type which will be most profitable in determining the high-school course of study and the organization of high-school classes.

37677  
C4  
D4  
S4  
MAR 10 1919

# REPORT OF THE SCHOOL SURVEY

of

**School District Number One**

**In the City and County of**

**DENVER**

## **Part III.**

### **VOCATIONAL EDUCATION**

**By C. A. PROSSER, Ph.D., Director William Hood Dunwoody Industrial Institute, Minneapolis, Minnesota.**

**W. H. HENDERSON, Director Training of Teachers for Industrial Schools, University of Wisconsin, Milwaukee, Wisconsin.**



**The School Survey Committee**

**Denver, Colorado**

**1916**





**DENVER SURVEY**

**FOR**

**VOCATIONAL EDUCATION**

---

**A REPORT MADE UNDER**

**THE AUSPICES OF THE SCHOOL SURVEY COMMITTEE REPRESENTING**

**THE DENVER BOARD OF EDUCATION**

**AND**

**THE COLORADO TAXPAYERS PROTECTIVE LEAGUE**

**BY**

**C. A. PROSSER and W. H. HENDERSON**



## FOREWORD

This study of vocational education in Denver has been made under the direction of the School Survey Committee, representing the Denver Board of Education and the Colorado Taxpayers Protective League. It was begun on the 28th day of February and was submitted to the parties in interest on April 10, 1916. A total of five weeks was given to the survey, of which three were spent in the actual field work of gathering facts and making investigations. It is obvious that the short time available for the study has not permitted the thorough-going treatment of the problems presented which has been possible in some other surveys for vocational education.

We feel, however, that it has been possible to present an accurate picture of the conditions with regard to vocational education, particularly in the public schools of Denver to point out the steps which need to be taken in developing a wider and a more efficient program of practical training; and, where the situation seemed to justify it, to offer specific suggestions, as to improvements. At the same time, we feel strongly that the results hoped for will not be achieved unless the Denver schools enter at once upon a program which shall provide efficient organization and supervision for vocational education, continue the much needed study of the problem and secure the close cooperation of the trades, industries and occupations as well as that of the citizenship generally. All experience shows that without these things but little can be accomplished.

The aim of this study was as far as possible in the limited time available to accomplish these things:

1. To determine to what extent there is a need for vocational education in Denver.
2. To learn to what extent this need is now being met properly by public and private facilities.
3. To recommend a program for vocational education for the public schools of Denver by which they can more fully meet the needs of the situation.

## Method

Duplication of effort and needless expense were avoided by collecting carefully at the outset, all available data bearing on the questions to be studied. The records of the Superintendent's office were first examined for all material bearing upon all such things as attendance, retardation, elimination, causes of withdrawal. United States census reports on occupation for 1910 were studied, and all material showing the numbers of people engaged in various occupations was tabulated.

The attitude of employers and employes of the city was learned through personal conferences with officers of the Denver Retail Merchants' Association, the Denver Manufacturers' Association and the officers and members of the Denver Trades and Labor Council.

Information concerning the schools was obtained by personal interviews with teachers, supervisors and principals. A sufficient number of classes in each subject was visited to gain a knowledge of the purpose, contents and methods of the classwork. The information concerning the costs of various subjects was obtained from the records in the business office of the schools. Facts concerning the numbers in classes, courses of study, and time spent by pupils were furnished by supervisors of various departments and principals of high schools. Information concerning equipment and teachers' programs came from schedules made out by teachers themselves.

In endeavoring to determine the value of the work offered in each of the school departments studied in this survey, an effort has been made to secure the opinions of teachers, supervisors and principals regarding its purpose. From the standpoint of this purpose, the survey has attempted to evaluate the training offered in the schools. The report has then attempted to set up certain purposes which the work might well have and has sought to suggest ways and means by which these purposes could be realized.

Comparisons of the work, as offered in Denver, with that of other school systems, have not been given. It has been assumed that the survey is made for the purpose of diagnosing the situation in Denver, in order to prescribe remedies. It has not been considered necessary to diagnose Denver's situation by comparing it with other cities', as it is presumed that the city is not interested very much in knowing whether its work is more expen-

sive than other cities, or whether it is less effective or more so than in other cities, as it is in whether the work in Denver is what it ought to be. Furthermore, it is extremely doubtful if, with the wide variety of practice in the schools of the country at the present time, statistical information as to what other cities are doing would be very helpful to Denver, where any effective program of practical education must be adapted to local conditions. Denver must work out her own salvation. It is assumed that the city wishes to know whether it is securing full value for the money being spent for this work in the schools and if the money might be spent to better advantage in other ways. On this basis, the effort has been made to evaluate the work of various departments.

The material of this report is presented in four sections, as follows:

- I. The Need for Vocational Education in Denver.
- II. What the Denver Schools Are Doing for Vocational Education.
- III. What the Private Schools of Denver Are Doing for Vocational Education.
- IV. A Suggested Program for Vocational Education in Denver.

This report is respectfully submitted to the School Survey Committee representing the Denver Board of Education and the Colorado Taxpayers Protective League, under whose joint auspices the work was undertaken.

C. A. PROSSER,

Director, William Hood Dunwoody  
Industrial Institute, Minneapolis,  
Minnesota.

W. H. HENDERSON,

Director, Training of Teachers for  
Industrial Schools, University of  
Wisconsin, Milwaukee, Wisconsin.

## I.

**THE NEED FOR VOCATIONAL EDUCATION  
IN DENVER**

It should be understood at the outset that there is in Denver the same necessity for general education as preparation for all work which every section of the country recognizes. One of the most important ways in which the educational institutions in every city promote efficiency for labor as well as for life is through training, which makes for greater intelligence and better citizenship. There is every reason to assume that the schools of Denver, while open to many improvements, are discharging the task as well as most cities, at least.

The survey is concerned, however, with that type of vocational education which will prepare workers for the more common occupations in which the great mass of the people of Denver will eventually find useful employment. Denver has the same need for this type of education which other parts of the United States have. The "Commission on National Aid to Vocational Education" appointed by President Wilson, summed up the reasons for this education as follows:

"Vocational education is needed to conserve and develop our natural resources; to promote a more productive and prosperous agriculture; to increase the wage earning power of our productive workers; to meet the increasing demand for trained workmen; to offset the increased cost of living. It is, therefore, a wise business investment, because our national prosperity and happiness are at stake and our position in the markets of the world cannot otherwise be maintained."

The task of providing vocational education for Denver is no small one. With a population, according to the last census, of 213,381, a total of 97,235 persons were reported as engaged in wage earning occupations. In the appendix to this report is given an analysis of the numbers employed in occupation, skilled, semi-skilled and non-skilled, in the city of Denver. A general summary follows:



TABLE NO. 1

**Summary of Occupation Statistics for Denver**  
**From U. S. Census on Population, 1909, Vol. IV.**

OCCUPATIONS—	
Manufacturing and Mechanical Industries.....	30,587
Trade and Commerce.....	18,655
Domestic and Personal Service.....	14,803
Transportation . . . . .	10,405
Clerical Occupations . . . . .	9,916
Professional Service . . . . .	8,277
Public Service, Not Elsewhere Specified.....	1,325
Agriculture, Forestry and Animal Husbandry.....	1,869
Extraction of Minerals.....	1,398
Total . . . . .	97,235

In Appendix A, there is given a series of tables, which show the distribution of workers among the different occupations in each of these broad and general classifications of occupations. These tables show the number of workers in 1910-11 in each occupation, and classify them by numbers as to sex, into skilled and semi-skilled workers and laborers. Attention is here called, particularly to the first table, giving a summary of all the mechanical trades and industries.

It must be recognized, however, that although Denver is situated in the very heart of what are probably the richest natural mineral resources in the country, the city is not an extensive manufacturing center when compared with other cities from the standpoint of the amount and value of its manufactured output, or from the standpoint of the extent to which it has been able to take advantage of the natural resources of the region.

Although Denver stood 24th among the cities of the United States as to population in 1909, it ranked 59th in number of wage earners, 44th as to value of manufactured products and 51st in value added by manufacture. In the decade following 1899, Denver dropped from the rank of 33rd to 44th among the 75 leading cities of the country as to value of manufactured product.

There are doubtless many causes for this backwardness in manufacturing, which is common to practically all of the communities of Colorado. It does not lie within the province of this report to deal with all of these. Much of it is undoubtedly due to the fact that Colorado has prospered in the past because of the exploitation of its natural resources exported in a crude and unfinished state to distant communities where both, because of long experience and in many instances, previous training, skilled workers have been able to reap the larger and more important profit. Rhode Island, Connecticut and Massachusetts manufactured in 1909, out of raw silver, much of which came from Colo-

rado, silverware to the value of \$28,574,000, of which \$15,979,000 represented value added by manufacture, while the number of persons employed to do this work was 10,972, a group of workmen almost as large as the total number employed in all the leading productive industries of Denver. The greatest industry of Denver is slaughtering and meat packing, yet there is not a shoe factory in the state, and practically all of the hides produced here are made into leather goods in Milwaukee.

Colorado's wealth of minerals and virgin soil will not, however, withstand perpetual exploitation. In order to realize the full possibilities of its great natural resources, the state must train and develop skilled workmen, who can manufacture the raw products of the soil and mines of the state into articles of utility and taste. Thus, when the state exports its materials, it must or should receive in return some remuneration for the skill and taste of its workmen, in addition to the raw material taken from its soil. In the past, the state has received its pay for little more than the material taken from the soil and mines, and has received but little profit from its skill and workmanship.

In order, however, for the state to receive any of the world's wealth for its skill, taste and workmanship, these qualities must be developed in the workmen who manufacture the raw material into the finished product. As capital of this state, it is necessary that Denver lead in the establishment of ways and means of developing its workmen.

Within the past year, the commercial organizations of the city have entered upon a campaign to develop manufacturers in Denver and to make Denver a competitor in manufacturing with Eastern cities. Eastern states have for some years recognized the need of training and developing the skill and workmanship of the people who are to manufacture its goods. A few of these states provide that boys leaving school at the age of 14, must attend a Continuation School from five to eight hours a week. Some states bear from one-half to two-thirds of the cost of instruction in industrial schools.

Colorado has decreed by legislation that all children must attend school until the age of 16, unless they have previously completed the eighth grade. Instruction given in its schools, however, has been of that type which prepared for college and the professions. While instruction is necessary to those who are to enter the professions, the large majority of young people in the schools will not enter the professions and need a training to fit them for the work that they are to do. It is obvious that if these

people are to enter manufacturing occupations, they must have a training which will fit them for this work.

In a succeeding section of this report the question of withdrawal of pupils from school is considered in detail. It is there shown that, according to the school enrollment by years during the past twelve years, 25 of every 100 pupils entering the second grade do not, on the average, progress beyond the sixth grade; 32 of every 100 beyond the seventh grade; and 59 of every 100 do not go beyond the eighth grade. Only 41 of every 100 entering the second grade enter the high school and only 15 survive to the last year of the high school course. Of the pupils who enter high school, 50 of every 100 drop out before the beginning of the third year, and in the fourth year 56 have disappeared.

The records of the Attendance Department show further that practically all of these young people who withdraw from school, enter upon wage earning at an early age, with little, if any, preparation as a wage earning asset. In the absence of vocational education, many of them enter occupations requiring little, if any, preliminary skill or training. As the community has provided no opportunity for these young people to increase their preparation, it will be necessary for them to remain in low grade occupations unless they can secure it elsewhere.

To an increasing extent the modern commercial and industrial world, while setting increasingly higher standards for its employes, is less and less able to give them either the preliminary training or the related technical knowledge which they have. This is a task which the schools must discharge for those who leave school before completing the high school course to enter other than professional careers. It is as much the duty of the schools to send out many young people to work properly prepared to meet the demands of a vocation as it is to send out a few prepared to meet the entrance requirements of a college. Anything else is inconceivable in a truly democratic system of education. Nor should it be forgotten that the secondary school should be a vocational school to an increasing degree for many young people who expect to use the high school as a means of advantageous entrance upon callings where a high school education is a necessary or highly desirable asset. To these the school owes the duty of establishing more and more courses in which more of the subjects have to do with preparation for a business or industrial career.

Later on it is shown that in the sixth, seventh and eighth grades there are in the elementary schools of Denver 2,802 children from the first to the eighth grade inclusive, 14 years of age

and over, who are from one to six years behind grade, of which 1,544 are boys and 1,258 girls. A very small proportion of these pupils ever enter high school. Few of those who do will remain long enough to complete a high school course and should therefore have a type of education other than that which prepares for the professions.

The fact that there are in the city private schools giving commercial, industrial, and art education for which a total tuition of about \$200,000 a year is paid by the citizenship of Denver, not only shows the demand for this kind of training, but points the way which the public schools must go if they are to meet this great and growing need at public expense, as it should be met.

The richest asset which the city of Denver possesses today is the undeveloped skill, taste and creative ability of its young people. The city should no more hesitate to supply the facilities necessary to uncover and train these potential and absolutely certain capacities of its youth than it would to develop an inexhaustible municipal gold mine beneath its streets.

Democracy owes to no man a living, but it owes to every man preparation to make a living. It can discharge this responsibility only as it offers the facilities which will open the road to merit to the widely varying interests and abilities of its youth.

## II.

**WHAT THE DENVER PUBLIC SCHOOLS ARE DOING FOR VOCATIONAL EDUCATION**

In this chapter the work of the Denver schools and other agencies will be considered separately. The first section will deal with the public schools under the following heads:

1. Child Labor and Compulsory School Attendance.
2. Elimination.
3. Retardation.
4. Manual Arts Work in the Public Elementary Schools.
5. Manual Training in the Public High Schools.
6. The Denver Trades Schools.
7. The Public Evening Schools.
8. Commercial Work in the Public Elementary, High and Evening Schools.
9. Cooking in the Public Elementary and High Schools.
10. Art and Drawing in the Elementary Schools.
11. Art and Drawing in the High Schools.

## (1)

**Child Labor and Compulsory School Attendance**

Under the Colorado law, children must remain in school until the age of 16 unless they have completed the eighth grade of the elementary school or for special cause are given a working permit allowing them to leave school and go to work in a specified industry. In Denver, the enforcement of this law, as to permits, is in the hands of the Attendance Department of the Public Schools. As the name of the department would imply, it is also charged with the duty of enforcing the attendance of children upon the schools.

Space does not permit any extended description of the work of the attendance department. Probably no attendance officer in this country is more consecrated to this task than is the head of this department in Denver. It would be difficult to find anywhere an officer more sympathetic in dealing with children, more tactful in handling employers or more thoroughgoing in her personal efforts. The department is very greatly handicapped by the lack

of an adequate force with which to discharge its responsibility. The department has in addition to its chief officer, two attendance officers and a clerk with which to handle the great number of cases of absence, truancy, physical and medical examination and treatment, working papers and placement which daily demand attention in a city of a quarter of a million people. Some idea of the inadequacy of this force may be gained from the fact that Minneapolis, a city not much larger than Denver, has to aid the head of the Attendance Department in the discharge of this same service the following: Four attendance officers and two clerks in the Attendance Department; one clerk in the Permit Division. In addition a fifth attendance officer has been asked for by the Department. This does not include an assistant in the Vocational Guidance Division, recently employed.

In addition, this department at Minneapolis is aided by twenty school nurses who not only take over practically the whole burden of inspection and visitation of defective children, but also to a very great extent enforce the provisions of the attendance law. It is useless under the present conditions for Denver to expect any high degree of efficiency in the work of this department. The force is very much overworked and much of the time of the director of the department is given to details which should be devoted to organization of the office work and supervision of a force of field workers.

The important work of this department is carried on in a dark and probably more or less unhealthy basement of the East Side High School where the surroundings are, to say the least, unattractive and unimpressive to both the children and the public. No adequate filing facilities are provided, practically all of the records being kept in a crude way in pasteboard boxes, of the kind that might be gathered anywhere from a generous dry goods store. These card records have never been properly systematized so as to make readily accesible information either to the force of employes or to the public. In Appendix B of this report will be found a complete set of the records used in the Attendance Department of the Minneapolis public schools which have proved satisfactory, and which are in general of the kind that, in our opinion, could be used to great advantage in Denver. Their proper use, however, would require an office force larger than the present one.

Although the survey was not able to gather statistics, there can be no doubt that there are many children under 16 years of age who are neither at work nor in school. Perhaps a majority of these children graduated from the eighth grade



before arriving at the age of 16 and withdrew from school as the law permits, to roam the streets in idleness. We believe the time has come to assert in the law of Colorado as well as in other states, as a part of a program of child conservation, that all children under 16 must be either employed or in school. This would require an act by the legislature.

Some of the children under 16 who are now out of school and idle secured a working permit which, after a brief period of employment was returned to them by their employer and has not been returned to the Attendance Department, nor was the Attendance Department notified by the employer of the termination of employment of the youth.

The working permit now issued to children under 16 years of age is issued "on the express condition that it be surrendered to said minor, whenever he (she) leaves the service of said employer; in which event the further expressed condition of this certificate is, that the employer will return the certificate *to said child* and notify the Superintendent of Schools, Attendance Department, that such employment is terminated. If the certificate is not claimed by said child within 30 days of such time, it shall be returned to the office of Superintendent of Schools."

It is a mistake to allow this permit ever to fall into the hands of the child. The certificate should provide that whenever the minor leaves the services of the employer, the certificate should be sent by the employer directly to the Attendance Department of the public schools. It will greatly facilitate matters, if the certificate issued to the employer have attached to it a return post card addressed to the Attendance Department of the Public Schools and containing this statement: "This is to certify that \_\_\_\_\_ (minor) has this day left our employment for the following reasons:" If this card be given the same number as the permit, the Attendance Office will have a record of every change of employment which the minor will make. It will also be necessary for the child to return to the Attendance Officer, before accepting further employment.

We desire to raise the question as to whether or not there are too many working certificates being issued to children under 16 years of age. There were no means whereby the survey could answer this question in the brief time available. Discretion is given to school authorities by the law whereby they may issue permits to persons under 16 who have not completed the eighth grade in cases where the "child's help is necessary for his own or his parents' support; or where for good cause shown, it would

be for the best interests of the child to be relieved from the provision of the law.”

During the year 1914-15, a total of 535 permits were issued to working children. The report of the Attendance Department shows that these children were distributed in grades as follows:

Eighth Grade . . . . .	284
Seventh Grade . . . . .	163
Sixth Grade . . . . .	65
Fifth Grade . . . . .	19
Fourth Grade . . . . .	2
Not stated . . . . .	2

It is apparent that these children left the schools, public and private, very greatly handicapped for life. At the present time, the law does not provide in any adequate manner for the further training of these handicapped youth. The only provision at present is that in cases where the child cannot read at sight and write legible sentences, he shall attend a public evening school, if the city conducts one. All experience shows that the compulsory attendance of immature children in evening schools after long hours of labor works more physical ill than educational good.

An examination of the employments which these 535 children receiving working permits during the year 1914-15 entered with their first permits shows that the work paid on the average very low wages and the most of it offered very little opportunity for the future. While the figures obtained from the Attendance Department are by no means complete, they are sufficient to furnish a picture of the situation. In reading the table it should be remembered that only an average rate of wages is given and many fell below the average in their rate of pay.

TABLE NO. 2

Occupations and Wages of Permit Children, Denver, 1914-15

Name of Occupation—	Number	Wage
Stores . . . . .	233	Girls, for most part cash girls at wage rate of \$3.50 per week. Boys, hoppers, \$4.50 per week.
Groceries . . . . .	19	Average, \$5.00 per week, sometimes paid in groceries.
Laundries . . . . .	16	Piece work, average \$6.00 per week.
Candy Factories . . . . .	10	Piece work, average \$6.00 per week.
Errand Boys . . . . .	74	\$5.00 per week.
Offices . . . . .	24	\$5.00 per week.
Housework . . . . .	9	\$2.50 per week.
Trades . . . . .	54	No rate given.
Miscellaneous . . . . .	96	No rate given.

Undoubtedly the pressure on the Attendance Office to issue working permits is strong. It is also true that there are some cases in every city where all such things as desertion, illness,

and death make the plea of poverty one difficult to meet. Society however, needs to protect itself and safeguard the future by providing other means of temporary relief so as to secure at least a minimum of education for every child. Undoubtedly the premature employment of immature children with insufficient schooling reduces their worth as workers and citizens at the upper end of their careers. We believe the time will come when the state will provide scholarships for the children of the indigent so that they may not suffer from either the bitter handicap of ignorance or of the customary poor relief.

Furthermore, every tightening of the restrictions upon school attendance and child labor has, even when met at the outset with vigorous protest, been accomplished without great difficulty and without apparent hardship and suffering. Since March 1, 1915, no working permits have been issued in the city of Minneapolis to children under 16 who have not completed the eighth grade.

One difficulty has been and it still continues in Denver as elsewhere, that there is a common feeling on the part of all concerned, that in the case of many of these children, the schools are not at the present time offering work in which the children are interested and in which they are making progress in subjects which will be of benefit to them in wage earning. When pre-vocational and vocational classes are established in Denver, in which these boys and girls can, while getting a better general education in a way better adapted to them, secure at the same time practical training which will help them to earn a better livelihood, the Attendance Office of the schools and the teachers will feel much more justified in insisting upon the school attendance of practically all those who have not finished the elementary school, until 16 years of age.

We believe that there are cases in which children over 14 and under 16 years of age need and should go to work, provided that work can be made educative. The whole situation would be greatly improved if a law were passed which asserted the principle that every child is the ward of society through the schools up until he is 16 years of age. The purpose of this wardship is to conserve him by regulating his education and his employment. This law should place in the hands of the school authorities, after careful consideration of the case, the discretionary power to permit the kind of youth we have in mind to be employed in work of which the school authorities approve as to hours, sanitation, safeguards, educational and other opportunities. This law should also require such a youth to return

to school weekly or biweekly for a portion of his time for further training.

*Recommendations:* To summarize the above discussion, we recommend that:

1. An adequate force of office and field workers be provided for the Attendance Department of the public schools. For a city the size of Denver, this should include at least two clerks and six officers.

When school nurses are added to the school force they should be made a part of the machinery *already* organized, for much of the physical and medical examination work, and visitation and attendance work of the Attendance Department.

2. Better quarters and improved office equipment and facilities for the Attendance Department should be provided at once.

3. A better system of office records for the department should be established. The system of records used in the Attendance Department at Minneapolis is submitted herewith in Appendix B as furnishing an excellent basis to be considered in such a reorganization.

4. An act should be passed by the legislature requiring all children under 16 to be at work or in school. This would make it necessary for graduates of the eighth grade to either continue in school or secure employment.

5. The working permit issued by the Attendance Department should be returned to the school authorities by the employer and not by the child when the employment ceases.

6. Every effort should be made to reduce the number of working certificates now being issued annually.

7. Where children have not reached at least a seventh grade standing and poverty makes their employment necessary, the state should support the child by some form of scholarship rather than to issue a working permit or resort to some form of poor relief.

8. The case of the illiterate child who must go to work under the provisions of the present law should not be reached and treated by compulsory evening school attendance after long and exhausting hours of labor, but by special relief in the form of scholarships or by compulsory part-time schooling dividing the time between the shop and the school so as to make both experiences educative.

9. Legislation should be enacted in Colorado which will lodge in the hands of the school authorities the discretionary power of placing the youth under 16 years of age in an approved

occupation, at the same time requiring him to attend school for a part of his working time to extend his education, both general and vocational.

(2)

### **Elimination**

Better school attendance and child labor laws and improvement in their enforcement have resulted in a steady decrease in the number of children dropping out of the upper grammar grades in the last twelve years. This is clearly shown by the following table:

TABLE NO. 3  
School Enrollment by Years,  
1914-1915

	1903-4	1904-5	1905-6	1906-7	1907-8	1908-9	1909-10	1910-11	1911-12	1912-13	1913-14	1914-15	Average
Kindergarten ...	2,499	3,157	3,063	3,359	3,768	3,718	3,844	4,053	4,095	3,957	3,993	4,001	3,625.5
First Grade ....	5,411	4,930	5,158	5,087	5,490	5,498	5,531	5,049	4,668	4,516	4,418	4,275	5,004.2
Second Grade ..	3,471	3,586	3,800	3,696	3,791	4,133	3,668	3,891	3,770	3,692	3,405	3,402	3,692.0
Third Grade ....	3,819	3,785	3,629	3,816	3,871	3,865	4,175	4,112	4,001	3,842	3,799	3,618	3,861.0
Fourth Grade ...	3,766	4,035	3,779	3,987	4,160	4,098	3,967	3,942	3,919	3,811	3,729	3,921	3,926.1
Fifth Grade ....	3,314	3,560	3,673	3,557	3,651	3,648	3,909	3,903	3,786	3,569	3,545	3,377	3,624.3
Sixth Grade ....	2,950	2,767	3,001	3,430	3,313	3,302	3,209	3,329	3,651	3,509	3,221	3,181	3,238.5
Seventh Grade ..	2,282	2,342	2,498	2,518	2,793	2,902	3,097	3,130	2,812	2,948	3,054	3,005	2,781.7
Eighth Grade ...	1,712	1,960	2,048	2,107	2,149	2,433	2,605	2,844	3,300	3,029	3,043	3,299	2,544.0
Ninth Grade ....	....	1,307	1,492	1,311	1,483	1,729	1,590	1,568	1,600	1,829	1,452	1,452	1,528.4
Tenth Grade ....	2,783	907	859	1,055	1,147	972	1,203	1,407	1,340	1,146	1,349	1,238	1,147.5
Eleventh Grade .	....	409	529	675	696	726	723	768	700	776	861	867	702.7
Twelfth Grade ..	....	229	364	415	486	554	618	578	650	671	750	702	547.0
Total . . . . .	32,007	32,974	33,893	35,013	36,798	37,578	38,139	38,574	38,312	37,295	36,619	36,338	36,222.9



There has been a most commendable improvement in the number of pupils, who, after entering the high school, remain from year to year. In 1904-05 the number in the tenth grade was 69% of the number in the ninth grade. The number in the eleventh grade was 31% and the number in the twelfth grade was 18%. On the other hand, in the year 1914-15 the number in the tenth grade was 86% of the number in the ninth, the number in the eleventh grade was 59% and the number in the twelfth was 48%. This shows that almost three times as many pupils who entered the high school remain to graduate now as did ten years ago.

But notwithstanding this gratifying improvement in the number of children who remain longer in school, there still exists a large amount of elimination in the grades and in the high school. Taking the average enrollment as given in the last column of the foregoing table, the decrease in enrollment in each grade from the number in the preceeding grade was as follows: From eighth to ninth, 40 of every 100; from ninth to tenth, 26 of every 100; from tenth to eleventh, 39 of every 100; from eleventh to twelfth, 22 of every 100; and from the eighth grade to the twelfth grade 78 of every 100 enrolled in the eighth grade.

An inspection of the table shows that the enrollment in the first five grades has remained fairly constant during this time and that, roughly speaking, this is also true of the sixth grade, there being a difference of less than 100 pupils in the enrollment for the sixth grade during the year 1914-15 and the average enrollment for the grade for the past twelve years. It shows further that the various laws concerning school attendance which have been enacted have retained in the seventh and eighth grades a large number of pupils over 14 years of age who without this legislation would have gone to work. The best evidence of this is furnished by a comparison between the enrollment of these two grades in the year 1903-04 and the year 1914-15, with the enrollment in the first six grades remaining practically the same in both years. The enrollment in the seventh grade has risen from 2,282 to 3,005, an increase of 34%, while the enrollment of the eighth grade has increased from 1,712 to 3,299, an increase of 92%.

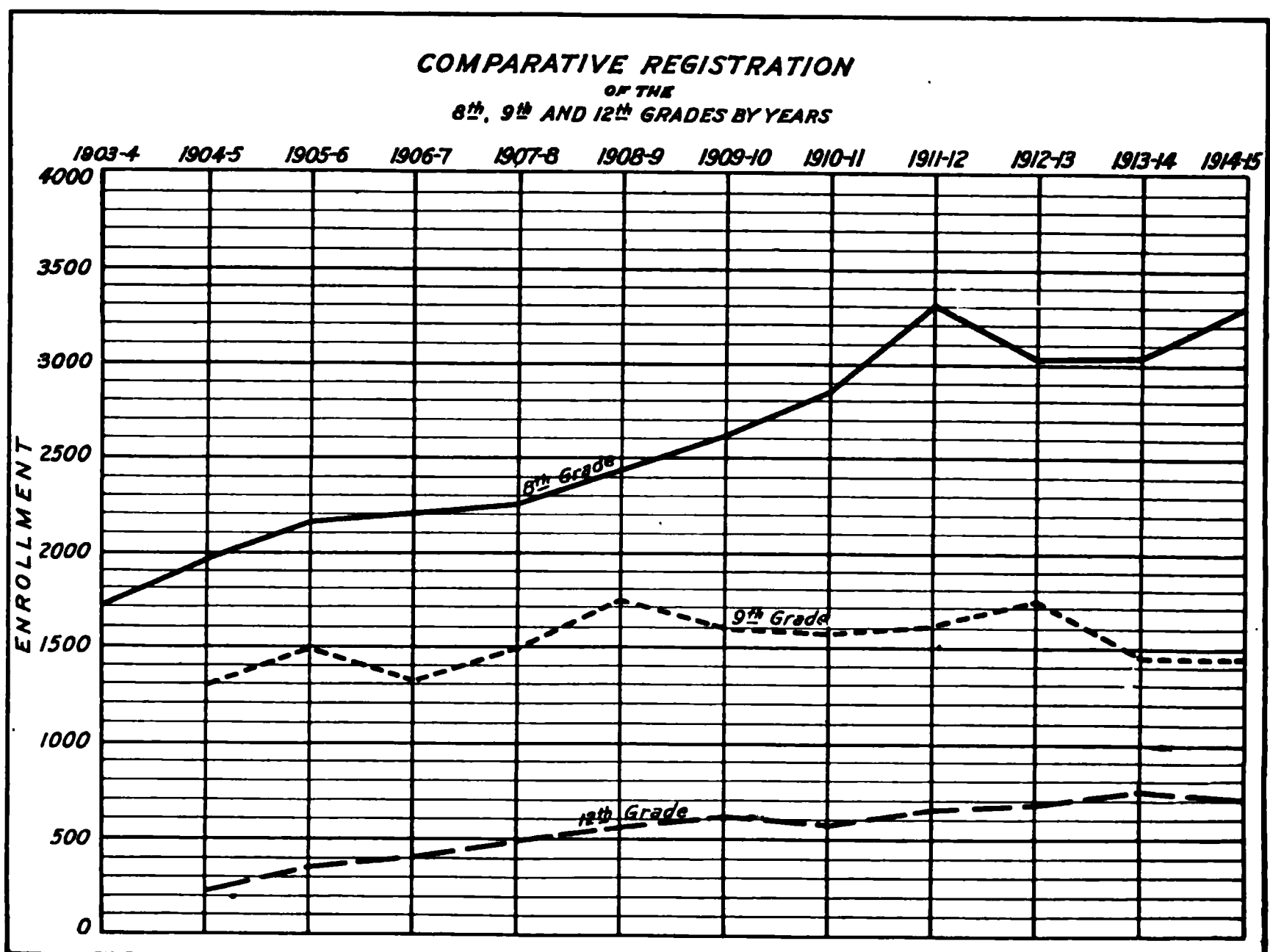
Using as a basis only the enrollment of all grades in 1914-15 as given in the table, the ninth grade showed a falling off of 56 of every 100 as compared with the eighth grade; the tenth a falling off of 14 out of every 100 as compared with the ninth; the eleventh grade, a corresponding falling off 30, and the

twelfth grade, 19; while between the eighth and twelfth grades there was a falling off of 79 out of every 100 students enrolled in the eighth. Tracing back the 702 student enrolled in the fourth year of the high school in 1914-15, to the year when this same class was in the eighth grade, 1910-11, one finds a loss of 75 out of every 100 who enrolled in the eighth grade.

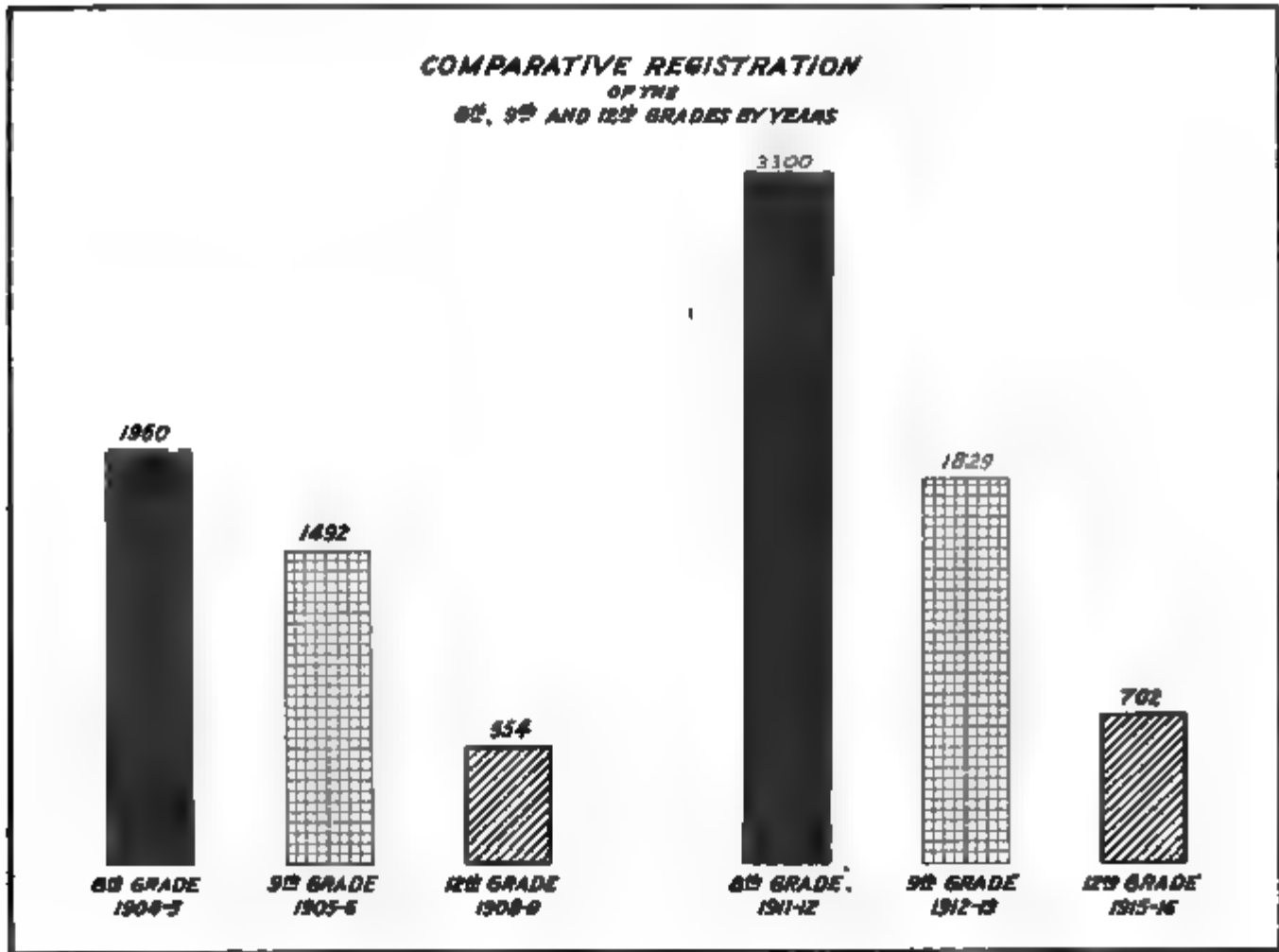
These figures are made all the more significant when it is pointed out that they are based on the enrollments in a total school population, which, as is shown by the table, has remained practically constant in the last twelve years.

While the proportion of pupils who enter the second grade and reach the eighth grade has constantly increased, the proportion of eighth grade pupils who enter the high school or who complete the high school has constantly decreased during the past twelve years. This is clearly shown by a comparison of the enrollment in the ninth grade for each of the years beginning with 1904-05 with the enrollment in the eighth grade for the previous year as given in the table; and by comparing the enrollment of the twelfth grade with that of the eighth grade of the fourth previous year.

It may serve to clarify the previous detailed discussion to supply the following graph showing the comparative registration of the eighth, ninth and twelfth grades for the past 11 or 12 years:



The great difference in the proportion of eighth grade pupils who attended the high school eleven years ago and now is shown by the following diagram:



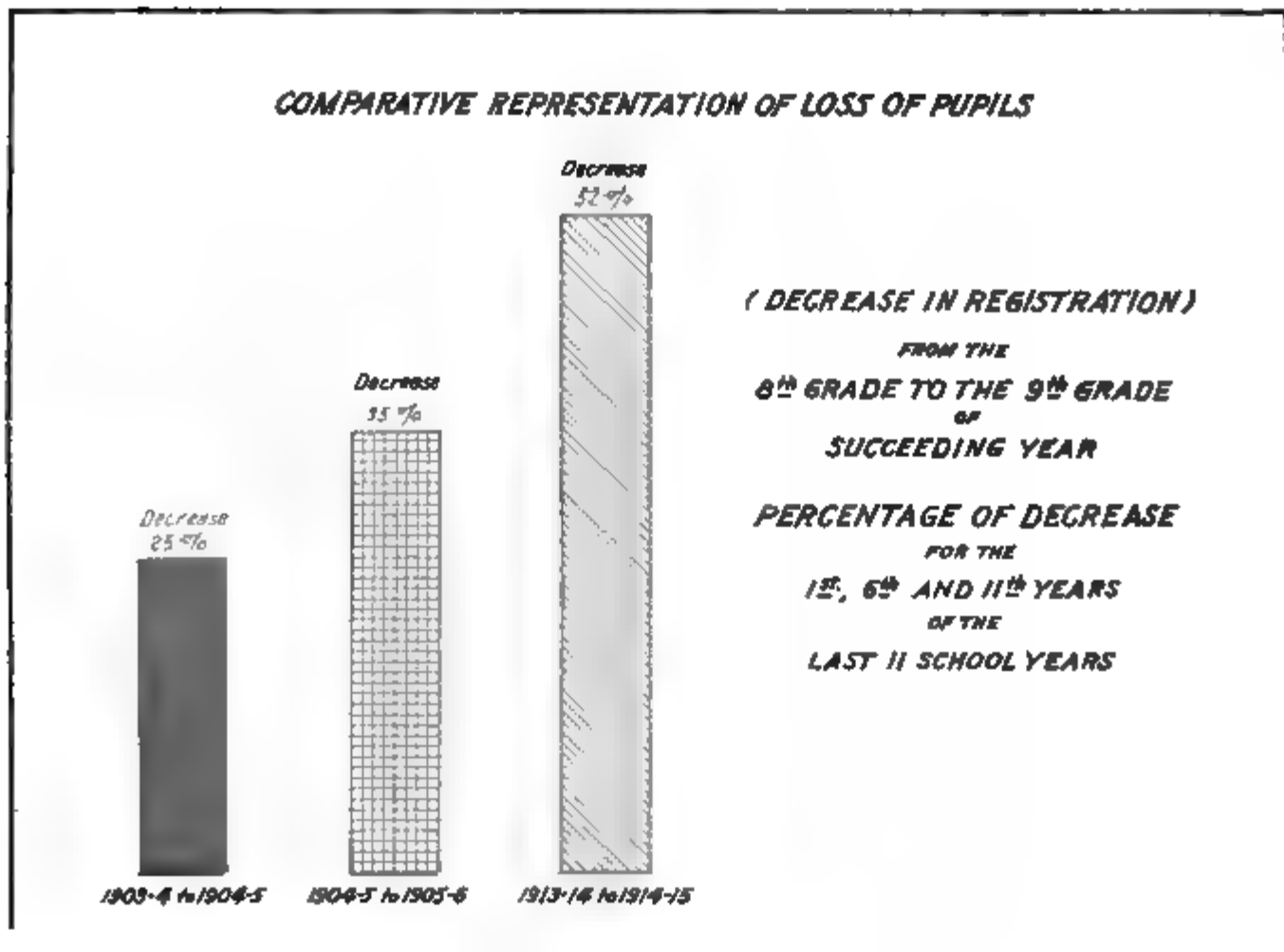
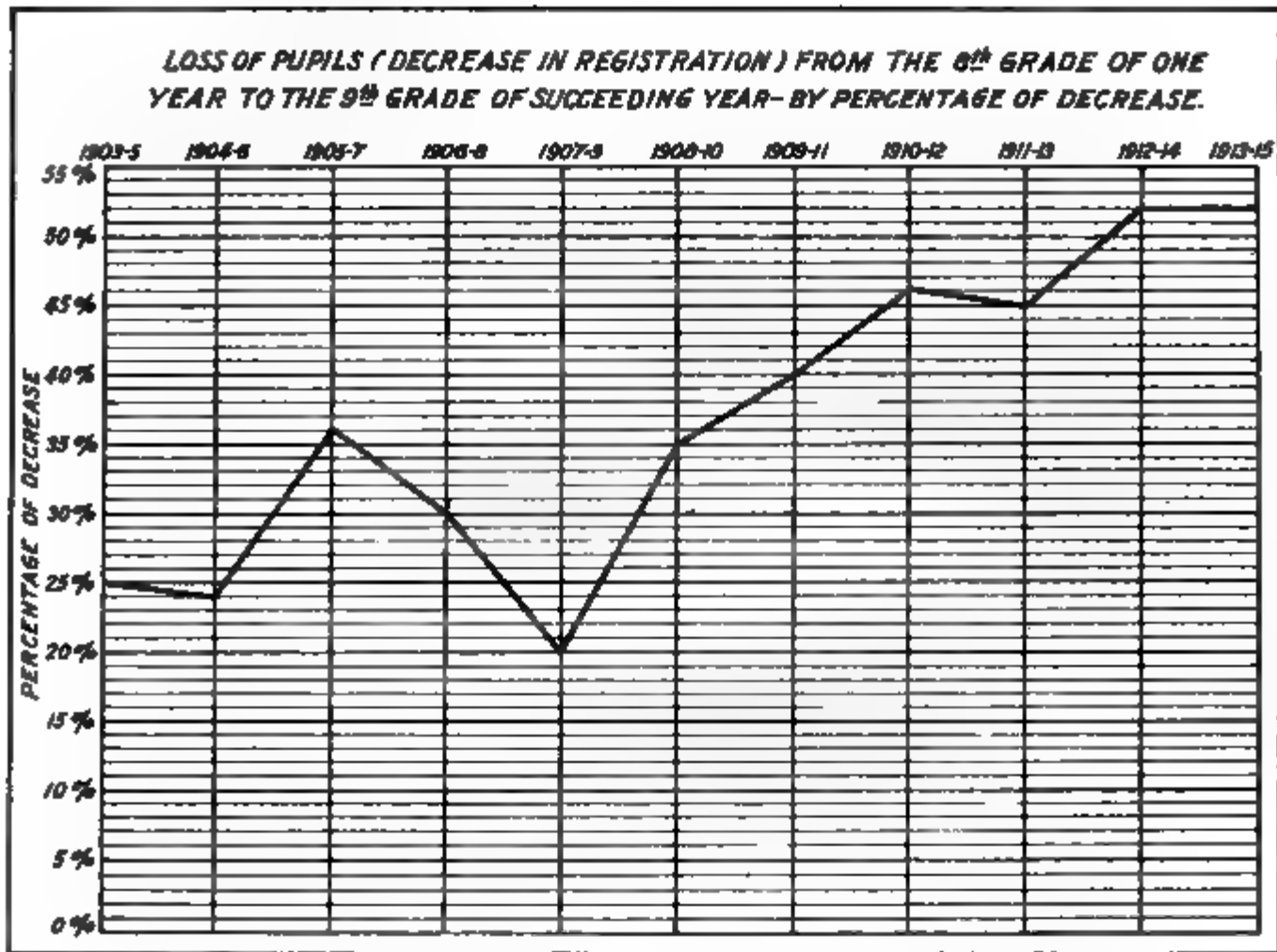
Assuming that the losses and gains due to deaths, removal from city, accessions to city, etc., were the same each year, we find that year by year, the falling off between the eighth grade and the high school was as follows.

TABLE NO. 4

Percentage of Decrease in Enrollment From Eighth Grade to First Year  
High School in Succeeding Year

8th Grade	9th Grade	Percentage of Decrease
From 1903-04	to 1904-05	25%
From 1904-05	to 1905-06	24%
From 1905-06	to 1906-07	36%
From 1906-07	to 1907-08	30%
From 1907-08	to 1908-09	20%
From 1908-09	to 1909-10	35%
From 1909-10	to 1910-11	40%
From 1910-11	to 1911-12	46%
From 1911-12	to 1912-13	45%
From 1912-13	to 1913-14	52%
From 1913-14	to 1914-15	52%

This decrease in enrollment from year to year is also shown by the following graphs:



The proportion of eighth grade pupils who entered high school in 1914-15 was only one-half as great as in 1904-05. While the enrollment in the eighth grade rose during the twelve years from 1904-05 to 1914-15 from 1,960 to 3,299, a gain of 1,339 pupils, the enrollment in the first year high school increased from 1,307 to 1,452, an increase of only 145. In other words, out of an increase of registration in the eighth grade of 1,339, the high schools were able to attract only 145 or a little over 10%.

With their present courses, the high schools are not even holding their own in attracting to them the pupils who finish the elementary schools. It would seem perfectly obvious that new courses are needed which appeal to the interests and meet the vocational needs of this large army, numbering more than those who enter high school, who at present do not attend school beyond the eighth grade. A discussion of the type of courses needed is given in the succeeding sections of this report. The fact is mentioned here to form a basis for that which follows.

The high schools of Denver are well organized and excellently conducted institutions. They are doing good work for the group of boys and girls who now attend them. What is needed is a clear recognition of the larger field which they must occupy by the enrichment of their curriculum with new courses appealing to the varying interests and talents of that larger group which now remain outside the field of their service.

At the same time, however, it should be pointed out, in justice to the high schools, that the various legislative acts which have been passed during the last twelve years, raising the age of compulsory attendance to 16 and adding one restriction after another upon the employment of children under that age in factories and workshops, has thrown back upon the upper grades of the elementary school, many children who would otherwise be at work. Many of these are over age and have no thought or chance of going to the high school. This has increased very much the enrollment in the grammar grades of children for whom the high school can not be held responsible. Such children, as is pointed out later, must have their needs met by differentiated courses of study, prevocational in aim, given in the upper grades of the elementary school.

### (3)

## Retardation

There are in the elementary schools of Denver 3,786 children over 14 years of age. More than two out of three of these

children (2,682) are one year or more behind grade. Of these over age children 1,444 are boys and 1,238 are girls. These boys and girls are over fourteen and under sixteen years of age. They are distributed among all the grades from the first to the eighth inclusive. The law requires all of them to attend school. Practically none of them will ever go to high school and most of them will go to work as soon as the law permits. Since the state has exacted school attendance from these children on the theory that they need better preparations for the duties of life, the gravest responsibility rests upon the schools of giving them preparation, not only in the three Rs, but in the things that will enable them to earn a livelihood.

Practical activities in the industrial arts, when properly taught in the elementary school, will tend to prevent retardation, by appealing to the "motor minded" child, through actions rather than abstractions. No special provision has yet been made to give training in the manual arts to average boys and girls.

It should be remembered at the same time that vocational education is not intended primarily for the retarded child. It is most effective with normal, capable, red-blooded and ambitious adolescents and adults.

The evil results of retardation need not be enumerated here. While some over-age children are behind grade because of late entrance to the schools, an overwhelming majority of them have repeated one or more grades. In other reports of this survey, this question is treated quite fully. The subject is mentioned in this report to show the relation between retardation and the need of vocational education in the city. A basic training in the subjects which underlie all education is fundamental to vocational education. It is doubtful whether pupils who have not reached the seventh grade can profit greatly by a specific training for a vocation, and training for many vocations requires at least a completion of the elementary school.

Any considerable degree of advancement in any vocation lies open only to the persons with such fundamental preparation. The effect of retardation is the bringing of thousands of children to the age when they require vocational training with insufficient general education to profit greatly by it. The certainty that many children will leave school at the earliest opportunity, places the gravest responsibility upon the school, not only of giving them vocational training before they leave, but also of preparing them to receive it.



*Summary.* The points emphasized in this discussion of elimination and retardation are these:

1. Like all large cities, Denver has thousands of children who leave the public schools as soon as the law permits. A responsibility rests upon the school system of providing prevocational training which will give them a basis of choosing somewhat intelligently the occupation they will enter, or the training they will enter upon for an occupation.

2. As a result of better laws and better enforcement of the laws, the enrollment in the upper grades of the grammar schools is constantly increasing, while the percentage of pupils entering the first year of the high school has been constantly decreasing in the past twelve years. This has probably not been due to the failure of high schools, excellent as they are in many respects, to do high grade work in the courses they offer, but to the failure to offer courses adapted to the immediate needs of those who must begin self support at an early age.

#### (4)

### Manual Arts Work in Elementary Schools

Instruction in Manual Training is given to all boys of all grades from the third through the eighth, and is offered as an election in each of the four years in two high schools. The subjects taught in each grade, with the time allotment, is as follows:

3rd grade, cardboard work and drawing.....	1	hour a week
4th grade, cardboard work and drawing.....	1	hour a week
5th grade, wood work and drawing.....	1½	hours a week
6th grade, wood work and drawing.....	1½	hours a week
7th grade, wood work and drawing.....	2	hours a week
8th grade, wood work and drawing.....	2	hours a week

All the teaching of Manual Training is done by special teachers. Thirty-two teachers are employed for this work in elementary schools, the work being under the direction of a supervisor who looks after the ordering of all materials, arranges teachers' programs, plans the courses and supervises the instruction. Twenty-two of the teachers are women, while ten teachers and the supervisor are men.

A majority of these teachers are graduates of the Denver Manual Training High School, who have had some special training for teaching. The former supervisor conducted a summer school for manual training teachers, and many of these teachers

received their special training in these classes. Only two have had practical experience as mechanics in commercial shops. Several have had summer experience in the building trades.

Manual Training teachers in elementary schools are paid salaries ranging from \$720.00 to \$1,200.00 a year, beginning at the lower figure and increasing by \$60.00 a year until the maximum is reached. During 1914 and 1915 a total of \$29,758.00 was paid to teachers of elementary manual training.

The city has provided liberally for the manual training work. There are thirty-six manual training shops in the elementary schools. In the report of the schools for 1910-11 of the schools it is stated that each shop cost in benches, tools and other equipment, \$491.54. Thus the elementary manual training shops represent an expenditure of \$17,695.44, exclusive of rooms and lighting and heating facilities.

All tools and materials for the required work are furnished by the schools. In the seventh and eighth grades all materials costing over twenty-five cents in the year must be paid for by the pupil. The total cost of all supplies for elementary shop work during the year 1914-15 was \$2,394.09. Assuming that the number attending manual training classes during February, 1916, as the average number during the year, the cost for materials per pupil was thirty cents. On the same basis the cost of instruction in manual training in the third and fourth grades was \$2.49 per pupil for one year. In the fifth and sixth grades the per capita cost for one year's instruction was \$3.74, and in the seventh and eighth grades, \$4.98.

During the month of February, 1916, pupils were enrolled in manual training classes as follows:

3rd grade	810
4th grade	1,492
5th grade	1,549
6th grade	1,514
7th grade	1,341
8th grade	1,167

The statement of the plans, aims and motives of the course of study in manual training for elementary schools contains the following: "We believe that characteristics of good manual training are, development and knowledge, in the attainment of which, interest is an essential factor and utility a worthy and effective incentive. Creativeness is a most available vehicle and characters are the only goal; that thinking only when accompanied by action can give the broadest knowledge; that skill is

essential to progress and the maintenance of interest and respect to the work; and that the educational value of a subject depends upon its contribution to future development. We further believe that an industrial subject can be more highly cultural and more culture results from planning, designing or drawing an ordinary object, or from sharpening a chisel than results from twice the time spent on any passage of Caesar.”

The work in the third grade consists of small models made of cardboard. In this work, the pupil draws more or less accurately the pattern for the model to be made, cuts it out of cardboard and pastes it together. During the fourth grade considerable attention is paid to mechanical drawing and lettering, but the shop work itself, continues to be cardboard construction. The aims of this work, according to the course of study are, skill in the use of the hand, knowledge in construction and the cultivation of the creative faculty.

In the fifth grade, wood work is begun. At first the models are necessarily quite simple. The novelty of the use of tools is relied upon to hold the pupil's interest during the early part of this work. According to the outlines, considerable stress is laid upon the proper tools to use and the correct ways of holding and using them.

In the sixth grade, more stress is laid upon exactness and skill in the use of the tools, the use of which are taught in the fifth grade.

The work in the first half of the seventh grade is devoted to the making of tools for shop work, such as bench hooks, bench stops, saw racks, marking gauges, mallets, turning saws, try-squares, etc. In the second half of the year, the pupil is given considerable freedom in the selection of a project. This freedom of choice is limited only by the fact that the project chosen must be very simple, and confined to two or three piece articles involving principles studied in this grade.

The work in the eighth grade differs from that of the seventh grade in the kind, size and complexity of the model, rather than in the method of procedure. In this grade, the boy to a large extent chooses the models he will construct and is limited in this choice to projects involving the mortise and tenon joint and to projects which the instructor is confident he can construct properly. In this grade, the boy makes a working drawing of the model to be constructed and from this drawing he makes the article and finishes it with some suitable woodwork finish.

As now conducted, the course in manual training requires that boys and girls be separated at the end of the second grade for their hand work. The boys go to the manual training shop, the girls being taught sewing in their regular room by the regular teacher.

At the end of the second grade, boys and girls are separated for their hand work, boys going to the shops and girls receiving instruction in sewing from the regular room teacher. The girls begin with an exercise in basting on practice pieces. They are given a piece of cloth with a design stamped on it and practice stitches by following over the lines stamped in the cloth. This work when finished may be made into a doll's quilt. For the first year, the work is very simple, consisting for the most part in practice in various stitches. For the second year, the work is continued, increasing somewhat in difficulty, and so on through the third, fourth, fifth, sixth and seventh grades. In the seventh grades the girls make underwear, collars, bows, learn to stitch buttonholes and to make complete under-garments of plain material.

The time schedule is as follows: Third grade, one hour a week; 4th grade, one hour a week; 5th grade, one hour a week; 6th grade, one and one-half hours a week; 7th grade, one and one-half hours a week.

The present arrangement, whereby the boys and girls are separated for their handwork in the third and fourth grades, seems open to a number of objections.

We see no good reason why girls should not have some elementary training in cardboard construction work, the same as boys. If there be value in it as hand and eye training, girls should profit by it as well as boys. It is altogether probable that some of the sewing which is being done in the third and fourth grades calls for fine motor adjustments for which girls in these grades are not ready. Cardboard work calls for the play of larger muscles. All the results secured in the sewing work of these two grades would probably be gained early in the fifth grade if the work were postponed until then.

The ability to sew is undoubtedly a desirable accomplishment for every girl, but there is great danger that when little children, just out of the second grade, have sewing thrust upon them for five years in their school work, that they will become weary and disgusted with it. There is no reason why boys and girls should be separated for hand work in the third and fourth grades. There are a large number of manual training activi-

ties, which these children can be taught together. The object of this work is not to secure a finished product, but to teach the children to make their hands do what their minds direct, and this can be done on work which boys and girls can do together as well as on work which they do separately.

The scheme is an expensive one, costing double what it would cost if all the pupils in a room were taught handwork from the regular teacher. Half of it is now given by the manual training teacher for the building, who is paid for his time at a somewhat higher rate for doing work which in most cases, at least, the regular teacher could do as well. The time given by the manual training teacher could, in our opinion be used to much greater advantage, from the standpoint of prevocational education, if used for increasing the amount of shop work given to boys in the upper grades.

This report at another place points out the advisability of employing men only as teachers of shopwork for boys, which is to be of a more industrial type. Men competent to teach work of this character would be very expensive teachers of cardboard work to third and fourth grade pupils and probably could not do it as well as the regular teacher.

It is extremely difficult to determine the value of the manual training given in the upper grades of the elementary schools. No doubt, as a part of the general education of a boy it has been of value. Beyond this, the purpose of the work is stated so vaguely and in such general terms in the various reports and other publications of the school system, that it is almost impossible to determine what is its dominant aim. It follows that the work is given even from the statements of the manual training teachers themselves somewhat indefinitely, and with an obviously indefinite purpose.

Aside from the idea of hand and eye training, and this by working in wood only, the only other practical aim seems to be the acquisition of skill in the use of woodworking tools, only in a city whose ordinances prohibit the building of wooden structures within the city limits and which probably has a smaller proportion of woodworkers than any other city in the country.

In the absence of any definite prevocational or vocational aim established by the schools themselves for this work, it is necessary for us to propose a purpose for the shopwork of the upper grades and to measure the work in terms of that purpose. It is quite generally conceded that the purpose of shopwork in the seventh and eighth grades should be to furnish the boy an experience in a wide variety of industrial processes, tools and

materials which will give him a basis for choosing an occupation or training for an occupation, while at the same time it affords the same training in the following of directions, planning of tasks, accuracy and skill of hand, that the woodwork of the Denver schools now aims to give him.

Measured by this aim, the shopwork of the elementary schools of Denver gives the boy no definite idea of any industry, not even the woodworking industries, since it is neither cabinet making, carpentry, patternmaking or mill room work, but a series of tool exercises in wood as a material. Six years in the schools are given to exercises in wood, before any opportunity is given to work in any other material.

To make this shopwork a real experience in an industrial activity, the teachers must have had some experience in the industry itself. Only two of the thirty-two manual training teachers have had any considerable experience of this kind. Of the remaining thirty, twenty-two are women, who, because of their sex, cannot acquire such an experience.

### *Recommendations.*

1. That the present arrangement, whereby boys and girls are separated in the third and fourth grades, for manual work, be discontinued; and that some form of manual work be taught to boys and girls of the same room jointly by the same teacher.

2. That the shopwork of the seventh and eighth grades have for its dominant aim the giving of a prevocational training in various fundamental industries which will give all the results claimed for the present course, and in addition, equip pupils to make a more intelligent choice of an occupation or training for an occupation.

3. The chief purpose of this work should be not the acquisition of skill in tool processes as measured from a mechanic's viewpoint, but real and interesting experiences in various lines of the world's work. What is needed is not many shops and extensive equipment, but a greater variety of tools and materials with which to work.

4. More time must be allowed for this work if this aim is to be realized.

5. The shopwork might well include activities drawn from the industries and activities described below:

- a. *Woodworking.* To consist of carpentry and cabinet making, including such other forms of work as may be called for by the projects undertaken; the study of tools, machines, structures, such as a garage, poultry house, summer cottages; prob-



lems in framing, truss construction and repair work, with emphasis on the latter.

b. *Metal Working.* To consist of work in hot and cold bar metal; practical problems in repairs and construction which, developed in the equipping of the school, will supply work for some time. This will include such work as the making of braces and angle irons, bolts, machine and belt guards, simple tools, pipe cutting and threading, metal parts of electrical and other apparatus. In addition to this, the student should take apart and assemble old machines, seeking to find out how they work and why, and study carefully the principles of the automatic machines and methods of transferring power through machines to the final performing of the work. The intention of this work being to familiarize the student with general principles of mechanisms, projects in the construction of hand forges, water wheels, windmills, blowers, automatic coasters, and the like, will interest large groups of boys.

c. *Sheet Metal Construction.* Problems involving pattern cutting, soldering, riveting, and so on, furnish excellent opportunities for instruction in principles of plane geometry.

d. *Printing and Bookbinding.* Considerable work can be done with very limited equipment. The setting of type in a stick, proofing, proof-reading, correcting, printing of cards, announcements, letterheads, and so forth, required by the school. The small weekly school paper will furnish excellent practice for English classes to receive practical instruction in English in which they will be intensely interested. Printing furnishes an excellent opportunity for training in applied design.

e. *Electrical Construction.* Consisting of elementary work in battery construction, magnetism, induction, small motor and dynamo construction, wiring, electrical measurements and testing. Experiments with batteries, induction coils, the wiring of bells, telegraph instruments, telephones and circuits can be worked out on specially constructed frames. The wiring of simple circuits on walls or specially constructed racks will furnish opportunity for wiring of bells, annunciators, lights and machines.

f. *Simple Construction in Concrete.* To include experiments with Portland cement, the construction of devices for testing, and the casting and testing of blocks made, first of cement only, then with different proportions of sand, cement and gravel, and finally with reinforcement. The casting of clocks, posts, etc., will lead to the casting of garden seats, troughs, flower pots, window and porch boxes. Simple ornamentation of



concrete will afford excellent opportunities for the application of the study of industrial design. The building of steps, walks, walls and the making of mouldings for cylindrical casts by a process of sweeping, furnishes practice for a study of typical industrial processes.

g. *Building Materials.* Consisting of elementary work on such things as the mixing of mortar, the laying of brick in the simple bonds, the making of models and application of the commercial processes of making plaster casts; the mixing of paint, harmony and taste in colors, the preparation of various surface for painting and the application of paint to different surfaces.

h. *Industrial work should be supplemented by trips* to shops and buildings in process of construction and the systematic discussion of things observed.

i. *Drawing.* To be elementary in character, but practical and related directly to the projects undertaken by the pupils working in various shops.

6. The teachers for such a course should be men who have had some first hand experience in industry and who can give the boy some information as to what he will find in the industries. He must have a love and sympathy for boys and their problems and interests. Where the groups are large enough, it would be feasible for a man to teach the subject in which he had had experience. This would be possible in a junior high school, but in a majority of cases it will be necessary for a man to teach more than one line of work. Teachers of this work should be required during summers to acquire experience in the lines of work with which they are not familiar, but the school system should provide additional pay as a reward to the man for his greater teaching value.

7. "The intermediate or junior high school comprising the seventh, eighth and ninth grades, is the best administrative agency yet devised for meeting the need of training in the manual and industrial arts for adolescent boys and girls." (Recommendation of Special Committee on Manual Training, Minneapolis Survey.)

It brings together a large group of pupils of similar age who can be grouped for instruction in various ways, according to their interests and needs. It affords opportunities for differentiated courses of study not otherwise possible, and simplifies the problem of equipment for a proper prevocational course. Under no other scheme of elementary school training is it possible to meet properly the interests and needs of the over-age child, to so great an extent.

## (5)

**Manual Training in the Public High Schools**

The Manual Training course for boys, as offered in the Manual Training High School and the North Side High School, provides:

**First year:**

First term—Joinery, 10 periods a week.

Mechanical Drawing, 4 periods a week.

Second term—Free-hand drawing and design, 10 periods a week.

Mechanical Drawing, 2 periods a week.

**Second year:**

First term—Turning and molding, 10 periods a week.

Mechanical Drawing, 2 periods a week.

Second term—Pattern making, 10 periods a week.

Mechanical Drawing, 2 periods a week.

**Third year:**

First term—Forging, 10 periods a week.

Mechanical Drawing, 2 periods a week.

Second term—Machine shop work, 10 periods a week.

Mechanical Drawing, 2 periods a week.

**Fourth year:**

First term—Machine shop work, 10 periods a week.

Mechanical Drawing, 2 periods a week.

Second term—Advanced work in any shop line, taken in preceding grades, 10 periods a week.

Mechanical Drawing, 2 periods a week.

Making allowances for holidays and vacations, the schools in Denver are in session no more than 38 weeks a year, or 190 days. One term, therefore, is 19 weeks, or 85 days. Therefore, in the Manual Training course, the student receives 190 periods of 40 minutes each of joinery. The same time is given to turning and molding, pattern-making and forging, while 380 periods are required for the machine shop work. There is also the possibility of devoting 190 additional periods to any one of these subjects during the last half of the Senior year. He also has 342 periods of mechanical drawing and 190 periods of free-hand drawing and design. The joinery work consists of five exercises in making of joints, followed by a project consisting of a piece of furniture made for the home. As a rule, the teaching is very well done

with the small amount of time allowed to the work in a scheme of recitations filled with college preparatory courses in a short school day. It is done as well as could reasonably be expected. The pupil gets a good general knowledge of industrial processes, but does not get adequate practice or experience to acquire skill and insight sufficient to furnish, in the judgment of men in the trades and industries, proper preparation for advantageous entrance into the skilled industries. With a very few exceptions, the boys who are taking the work in high school, do not expect to go into the trades as apprentices or journeymen, and instruction is not given with this end in view.

The aim of this work, according to the pamphlet issued by the Manual Training high school, is "To bring thought and labor together; to make the thinker a worker and the worker a thinker. No attempt is made to teach any specific trade; the object of the training being the master of fundamental principles and processes, rather than the development of mere mechanical dexterity."

The work of the shops and drawing rooms is not closely correlated. The course in drawing is composed mainly of theoretical exercises in mechanical drafting. In fact, a knowledge of the shop work is not essential to the drawing work, or a knowledge of the drawing essential to the shop work.

In the Freshman year boys and girls do the same work in drawing. In the Senior year, boys draw and develop gears of different kinds, while girls make house plans.

The manual training work given in two Denver high schools will compare favorably with similar work in other cities, with whose aim and course of study it is in substantial agreement at all points. These schools have made no effort to train boys to enter the trades, but rather to afford discipline in tool processes. The presence of a trades school already established in Denver for the specific purpose of finishing trade instruction has relieved the high schools of any responsibility in this matter.

The manual training work of the high schools gives a very valuable part of a general education which any boy who is going out into a professional career might well have as part of his preparation for life. While some of the graduates of this high school manual training work do at the present time go into industrial activities of various kinds, the employers of Denver are of the opinion that the training is not what it should be for the

boy who is going out into industrial life on the business and directive side. They agree that there is a splendid opportunity for a youth coming out of a practical course in the high school in positions different from that of the tradesman, and are anxious to see the high schools take advantage of their opportunity to train such boys more effectively than they have in the past.

The Minneapolis Survey for Vocational Education uncovered in that city a large demand for the youth who, on leaving the high school, enters upon a career which might be called a non-commissioned officer of industry. Midway between the high grade technical engineer at the top, who might be looked upon as a commissioned officer, and the trade worker, who might be called the private in the ranks, there are a great many positions of responsibility constantly growing in number and importance which are open to promising young fellows who come from the schools with some knowledge of tools, machinery, processes, materials and workmanship on the one side, and training in mathematics, science and drawing on the other. Among a few of the many positions of this kind which might be listed are those given in the list below:

#### TABLE NO. 5.

##### List of Shops Which Would Be Open to Graduates of Some Technical Courses in the High Schools in the City of Denver.

1. This list is compiled from an actual study made by The Minneapolis Survey, but not hitherto published.

##### *Positions Found in Every Line.*

II. These positions are on the direct business side of the manufacturing line which call for the general education and technical training which such boys will have. They will be near the bottom in this line and work their way up through the positions described below.

##### *Positions Found in All Lines.*

These are found in all large and well-organized concerns: Superintendent; assistant superintendent; general foreman; foreman; assistant foreman; inspectors; draftsmen; machine designers; industrial designers; efficiency men; cost accountants; lay-out men; cost estimating; time-keepers; trouble men; erectors; piece work supervisors; checkers; graders; chemists; accountants; inspection supervisor; chief clerk; copy man; head

tester; circular manager; master mechanics; superintendent of instruction; salesmen; director of salesmen.

### *Gas and Electric Companies.*

General manager; superintendent of gas department; superintendent of electric department; chemists for testing illuminating and heating value of gas; the efficiency of coal consumption; engineer and draftsmen who design and lay out repairs and improvements for both departments; general foreman of retorting house; day and night foreman; bench foreman; foreman of coal crew; foreman in coke yard; chief operating engineer in power stations; assisting operating engineer; switch board engineer; sub-station operator engineer in charge of steam units; foreman in charge of distributing system, who looks after sufficient gas pressure, voltage on lines, etc.; foreman over street gangs, who looks after placing of new gas mains and installing over-head and under-ground wires.

### *Street Railway Work.*

*In Power Department:* Chief engineer; assistant engineer; operating engineer; assistant operating engineer; engineer in boiler room; foreman of coal crew; foreman of construction work; chief electrician and assistant in hydro-electric station; switch board operator; sub-station operators.

*In Mechanical Department:* Master mechanics; general foreman; foreman of motor repair department; foreman in foundry machine shop; mill room, paint shop, sheet metal department, etc.

*The Maintenance Department:* Engineer of maintenance of ways; draftsman; surveyors; foreman of overhead and underground construction; foremen of the sheet men and of street gangs.

*The Transportation Department:* Station supervisor; dispatchers; inspectors; superintendent of schedules; foremen in stations.

### *Large Manufacturing Concerns.*

Productive manager; office manager; sales manager; cost experts; foreman of inspection department; foreman of assembling department; foreman of manufacturing department; erection foreman; chief engineer; purchasing agent; store-keeper; chief order clerk; credit manager; traffic manager; head of shipping department.

### *Telephone Industry.*

Chief of district plant; district wire chief; assistant district wire chief; foreman and assistants in installation and maintenance; construction; cable department; equipment engineer; outside plant construction engineer; toll line engineer; traffic engineer; appraisers and draftsmen.

### *Railroad Shops.*

Master mechanics; foreman of car department; foreman of truck department; wheel men; foreman in air-brake, pipe fitters, painting, and carpentry departments; foreman of locomotive department; foreman of machine shop, boiler shops, blacksmith shop, pipe shops, welding shops, etc.

The above enumerated positions are typical of the large number of positions open to graduates of these courses in every industry.

Some idea of the extent of these employments in Denver may be gained from the following table, taken from the United States Census Report on Occupations for 1909-10:

**TABLE NO. 6**

**Positions in Denver to Which a High School Technical Course Might Lead.**

	Male	Female	Total
Foremen and Overseers, Manufacturing and Mechanical Industries.....	241	34	275
Electrical Engineers .....	765	..	765
Mechanical Engineers .....	897	1	898
Managers and Superintendents.....	337	3	340
Inspectors, Gaugers and Samplers.....	34	12	46
Garage Keepers and Managers.....	48	..	48
Foremen and Overseers of Railroad Transportation .....	158	..	158
Officials and Superintendents of Railroads .....	167	..	167
Foremen, Overseers and Inspectors, Road and Street Transportation....	220	2	222
Foremen Telegraph and Telephone Companies. ....	16	7	23
Civil Engineers and Surveyors.....	489	..	489
Designers .....	20	9	29
Draftsmen .....	151	11	162
Foremen, Overseers, Inspectors and Managers, Mining .....	115	..	115
Officers and Inspectors, County, City, State and United States.....	280	34	314
Total .....	3,938	113	4,051

Non-commissioned officers of industry are among the most important factors in efficient management or production, and the proper training of them is one of the most, if not the most, important tasks of the movement for industrial education, particularly in view of the fact that provision already has been made for the education of the technical expert. As a certain chief en-



gineer put it: "They save us from the mistakes we technical men only too frequently make, since they alone have a knowledge of the very rudiments of their department of the industry that can be acquired only by a man who has been brought right up through the ranks."

All the authorities are agreed that the great industrial development of Germany during the last decade, which has attracted the wonder as well as the admiration of the world, has been due in large measure to the excellent technical training with which the intermediate technical schools of Germany have equipped the capable workingman for leadership in the industrial and manufacturing life of the empire. England, after a careful study of the causes of the economic rise of Germany, is undertaking, through extensive evening classes and secondary technical schools, to supply men equally capable for the business and directive side of her industries. While through such private institutions as Pratt Institute, Cooper Union, The Mechanist Institute of New York, Bradley Institute, Carnegie Institute, Ohio Mechanics' Institute, Lewis Institute and others no less noteworthy, a great service has been performed for many years in the education of men for positions of responsibility, it is only lately that there has come to this country a true appreciation of the need of training on a large scale these non-commissioned officers of industry.

No hard and fast classification of positions into those of the commissioned and the non-commissioned officer can be made in the case of many industries. The difference between them is partly one of degree of authority, partly of amount and kind of responsibility, partly of amount of salary, and partly of the amount and kind of technical knowledge and practical experience required. It would be very difficult, even in any rough classification, to give a complete list of all the various subordinate positions in all of the industries that would come under the head of non-commissioned officer, inasmuch as they vary so greatly not only as between different industries, but as between different plants of the same industry.

As an industry becomes better organized, the demand for competent men for new positions, which a rising standard of efficiency requires, steadily increases. The cost accountant, the cash estimate man, the supervisor, the inspector, the tester, the production engineer, the line study man and the efficiency man—are all a direct result of the introduction of better methods into the work of the shop.

A special course for the training of the youth for such positions would meet with the hearty approval of the business world of Denver and be a success from the start.



In view of the fact that the course known as the "Technical Course" formerly carried on in the manual training high school failed, the use of "technical course" may be a little unfortunate, but we know no other term by which to describe what we have in mind.

In such technical course the emphasis would be laid on fitting the boy to meet the demands of the business and industrial world rather than to prepare him for college entrance. The school day would have to be lengthened to six or seven hours, preferably the latter. The amount of the shop work and drawing work would have to be doubled. The course would include experience in such fundamental industries as wood, metal, building material and power. The instruction in mathematics and science would be more practical and at the same time of a more technical and thorough-going character. Such subjects as salesmanship and simple accounting, cost accounting and filing should be dealt with. Business law and economics should take a place of importance by the side of civics and English.

This technical course should be organized as a separate department under a distinct head, and should have such a distinct organization of courses, teachers and pupils as will enable the work to realize its aims.

It should be made clear that the graduate of such a technical course in the high school would enter the industry in a subordinate position and as a learner; and that a subsequent career would depend not only on the thoroughness of his preparation, but also upon his ability, character and industry.

No course of this kind or any other vocational course will be successful unless an understanding is arrived at with the employers of the city with whom the school expects to place its graduated boys. In Minneapolis, employers have heartily approved of the establishment of such a course and have agreed to come to the school as their first source of supply when taking on new men for such positions at an initial salary of \$50.00 per month.

Such a plan also requires the help of an advisory committee from the business and industrial world in securing the proper equipment, courses of study, plan of organization and placement of pupils. Without such contact with the business world such a course is doomed to failure in advance as a venture in vocational training. The course of study given below is the one developed as a result of the Minneapolis Survey by the New Central High School after a careful investigation and numerous conferences with employers and business men.

TABLE NO. 7

TECHINICAL COURSE--MINNEAPOLIS CENTRAL HIGH SCHOOL--1916

SEMES- TER	SHOP		DRAWING Two Periods Daily	LABORATORY Two Periods Daily	MATHEMAT- ICS	ENGLISH	BUSINESS	GEOGRAPHY AND HISTORY	MUSIC AND GYMNASIUM	PERIODS A DAY	
	Weeks	Two Periods Daily									
1	5	Turning	Reading Drawings, Sketching, Pencil Drawings		Algebra, Commercial Arithmetic, Shop Mathematics	English, with Penmanship and Spelling			Music and Gymnasium	7 recitation	
	5	Foundry								2 study	
	10	Forge								9 total	
2	20	Pattern Making, Use and care of machines			Algebra, Commercial Arithmetic, Shop Mathematics	English, Penmanship and Spelling		Geography, Physical, Commercial Two Periods Daily	Music and Gymnasium	7 recitation	
										2	9 total
3	20	Cabinet- Making, with detailing, Millwrighting		Chemistry	Geometry, Shop Mathematics	English, Oral			Music and Gymnasium	7 recitation	
										2 study	9 total
4	10	Cement and Concrete, Painting and Carpentry		Chemistry	Geometry, Shop Mathematics	English, Oral		History, United States and Local, Industrial and Commercial		7 recitation	
	5									3 study	10 total
	5										
5	15	Carpentry, Sheet Metal		Physics		English, Salesmanship, Business Corresp'nd'nce		History, World, Industrial and Commercial	Music and Gymnasium	7 recitation	
	5									3 study	10 total
6	15	Machine Shop, Heat Treatment of Metals	Drawing	Physics, Shop Mathematics		English Salesmanship, Business Correspond- ence				7 recitation	
	5									2 study	9 total
7	20	Machine Shop	Arch. Drawing	Power, Laboratory, Applied Mathematics			Business Law, Accounting			7 recitation	
										2 study	9 total
8			Mechanical Drawing	Power, Laboratory, Applied Mathematics	Trigonometry Elective		Business Practice	Economics and Civics		7 recitation	
										4 study	11 total

Note: Subjects black-faced require outside study.

We recommend certain changes at the outset in this course of study for Denver because of certain differences in the two cities. As the building laws in Denver prohibit the construction of wooden buildings, we suggest that the time given to carpentry in the Minneapolis schedule be devoted to masonry. Since the foundry work in Denver is smaller than in Minneapolis, the pattern-making provided in the course should be limited to ten weeks and the time thus saved be given to plumbing. Inasmuch as gymnasium work and music are not required in Denver as they are in Minneapolis, the boy should be allowed to substitute shop work for these subjects. Other modifications will suggest themselves as the course is established.

### *Recommendations.*

1. We have no changes to suggest in the manual training work as given in the high schools of Denver as a part of general education.

2. There is need of a technical course in the high school, four years in length, which will prepare boys to go out in subordinate positions with promotion ahead of them on the business and directive side of industry.

3. Such a course should have a separate and distinct organization of teachers, courses and pupils specially arranged for this purpose.

4. An understanding should be reached by an agreement with the business men of the city for the placement of graduates in positions.

5. An advisory committee should be created, composed of representative business men and manufacturers to aid the school authorities to make the course a success.

6. Some such course as that outlined in the foregoing pages should be worked out with the approval of the advisory committee acting for the business interests of the city.

## (6)

### **The Denver Trade School**

The Denver Trade School is conducted in the shops of the North Side High School. Instruction is offered in three trades: Carpentry, Plumbing and Training.

In the report of the Denver Schools for 1910-11, the annual report of the Principal of the Trade Schools contains the follow-

ing: "Resolved: That the Superintendent be authorized to establish in the Ashland School, beginning with the school year 1911-12, a trade school for boys sixteen years of age or over, who have completed the eighth grade in the elementary schools, or who can by examination, show a preliminary training equivalent to the eighth grade; that this course be designed to be two years in length; that it offer training designed to fit boys for certain specific trade . . . ; that the Superintendent be authorized to prepare such circulars as may be necessary to inform the public as to the character of the work offered in this school; and that the Committee on Supplies be authorized to purchase such equipment as may be necessary to properly carry on the work of the school during the first year.

A circular sent to every boy in Denver between the ages of sixteen and nineteen years, gave information concerning the policy of the school.

"Boys of sixteen years or over who have completed the eighth grade or its equivalent, are eligible for admission. The length of the course is two years. The school will be in session five days each week from 8:30 a. m., with one-half hour recess at noon."

The school year is of the same length as that of the high schools, except that following the close of the regular session in June, a summer term of eight weeks will be given, in which the entire time will be devoted to trade instruction in the shop.

"The day is divided so that approximately 50% of the time is given to trade instruction in the shop, 25% of the time to trade drafting, and the remaining 25% to trade mathematics, trade history and science and to business English."

"The purpose of the school is to offer to boys the opportunity to secure a broad understanding of all the branches of one trade through expert shop and drafting room instruction, and through a study of the academic branches directly relating to that trade, to the end that they may become efficient workmen and intelligent citizens."

"While the school does not claim to turn out finished journeyman workers, it does claim to give to boys a trade training such as cannot be secured in the industrial shop, and a general grasp of the trades such as will make them efficient journeymen workers after a short practical trade experience outside the school."

The course of study is as follows:

## DENVER SCHOOL OF TRADES

## Course of Study

## CARPENTRY—

## First Year:

	Periods of 40 Min.
Business English .....	5
Elementary Science .....	5
Algebra and Geometry.....	5
Mechanical Drafting .....	5
Carpenter Shop .....	30
	—50

## Second Year:

Civics . . . . .	5
Algebra and Geometry.....	5
Mechanical Drafting .....	5
Carpenter Shop .....	35
	—50

## PLUMBING—

## First Year:

Business English .....	5
Elementary Science .....	5
Algebra and Geometry.....	5
Mechanical Drafting .....	5
Plumbing Shop .....	30
	—50

## Second Year:

Civics . . . . .	5
Algebra and Geometry.....	5
Mechanical Drafting .....	5
Plumbing Shop .....	35
	—50

## PRINTING—

## First Year:

Business English .....	5
Elementary Science .....	5
Mechanical Drafting .....	5
Printing Shop .....	35
	—50

## Second Year:

Civics . . . . .	5
Printing Shop .....	45
	—50

The school day begins at 8:30 a. m., closes at 4 p. m. and is divided into ten periods of 40 minutes each.

The school year has 45 weeks, seven of which compose the summer term. During this term all students spend the entire day in the shops.

During the years 1914 and 1915, the average daily attendance in the different courses was as follows: Carpentry, 13 students; Plumbing, 11 students; Printing, 2 students.

When it was first opened, only those boys were admitted who were sixteen years of age, had completed the elementary school and who showed that they were adapted to follow the work successfully. This rule as to age has not been followed lately, but graduation from the elementary schools is still required. As the trades are recruited largely from those boys who do not complete

the elementary school, only a small number of boys have applied for admission.

The equipment of the printing shop consists of two Gordon presses with complete layout of type, cutters and other paraphernalia of the modern printing shop. The carpenter shop is equipped with work benches and saws, circular saws, lathe, trimmers and a complete outfit of woodworking tools. The plumbing shop is equipped with frame work for a two-story building and the necessary kitchen sinks, bathtubs, toilets, etc., all that is necessary for teaching modern plumbing.

The instruction is thorough and in the shops, the work is mainly related to the work of the trade. The carpenter shop seems to be giving a course in cabinet making, rather than a course in carpentry. For the most part, the boys were making tables, book-cases and furniture, rather than working on house details, roof construction, stairways and interior finishing. In other words, the major part of the instruction is cabinet making, rather than carpentry or house construction.

All the shops of the school are productive. In 1914-15 the carpenter, plumbing and printing shops used material to the value of \$2,633.33 out of which they manufactured products for the city schools having a value of \$4,108.45. (See Appendix C on costs of equipment, material and value of product.)

It is quite apparent that the small attendance at the Trade School is caused by the entrance requirements which exclude a large number of boys who might otherwise attend the school.

The elementary schools of Denver have 579 boys, fifteen years of age, 185 sixteen years of age, and 50 seventeen years of age. A large number of these boys would gladly enter the Trade School if they could. A little inquiry among these boys demonstrated that many of them would gladly enter the Trade School at once if they were permitted to do so. In order to increase the attendance of the school, it is necessary that the entrance requirements be such as to admit boys who have not completed all of the grades of the elementary school.

Boys, who have reached the seventh grade and who are fifteen years of age, should be admitted to the school and while receiving instruction in the trades, should be given the elementary school instruction, which they would receive had they remained in the elementary school. In this way, they will have completed the eighth grade by the time they have finished the trade course in the school. There is no good reason why the Trade School should be placed on a high school basis.



More trades should be added to the present course. Automobile repair and construction work is one of the large industries of Denver and at present there is no opportunity, other than those afforded by the Y. M. C. A. for receiving such instruction. Facilities should be provided for teaching the construction of house details. A course in carpenter work should deal strictly with carpentry work and if a course in cabinet making seems to be required, such a course should be provided. A course in telephone construction, maintenance and repair work would also attract a large number of boys. The local telephone companies annually engage a large number of boys and they find it necessary to conduct classes of their own for such pupils.

The quarters of the Trade School are at present entirely inadequate. The school should be given a more suitable location and should be provided with more room, as it is being crowded out by the Manual Training work of the North Side High School. There can be little doubt that the present location of the school, away from the center of the city and the manufacturing district, is interfering with its growth.

In ascertaining the net cost of instruction in the Trade School, it is necessary to deduct the amount credited to the school for work done for the school system. It is obvious that the amount to be credited will depend upon the method of determining the value of the work done by the school. The survey has accepted the valuation placed upon this work by the Trade School itself. The director has stated, however, that in estimating the amount to be credited he has in all cases, charged the school, as near as possible, the amount that would have been charged by a commercial firm had it done the same work. In charging for the time of the boys, this time has in all cases been reduced to the time that would have been required by a man to do the same work and the charge made accordingly.

No arrangements have been made for giving prospective pupils an opportunity to test themselves out as to their likes or dislikes of the work offered by the Trade School, nor for the school to test the adaptability of the boy for the work which he wishes to undertake. Boys enter the school and on expressing their preference for any certain trade are admitted to that work, if they have an eighth grade diploma.

The Trade School boy costs the city for one year of instruction \$117.32 (See Appendix C.) In two years he would cost \$234.64. This per capita cost would be materially reduced if the school were so conducted that all classes were operated to their full capacity. The city has invested considerable money in equip-

ment for the three trades now taught in the School of Trades. This equipment is idle a very large part of the time. It should be opened for trade instruction in the evening to men already engaged in these occupations. A very large percentage of those in attendance at the evening elementary school stated that they feel that they need instruction in trade subjects and would gladly attend such courses if opened to them.

When one remembers that the cost of four years' instruction in the high school is approximately \$300, the money spent upon a school boy for all the education he gets beyond the eighth grade is comparatively small.

There is a noticeable disregard of factory rules and regulations in the shop work in the schools. In the Manual Training High School, the saw guard on the saw table was tied up to the ceiling and two boys were working on the machine, one pushing the board through and the other pulling it out. As the board was not more than two feet in length, good fortune only, prevented an accident. The band saw should either have a guard on the upper wheel or should have a circular piece of sheet metal fastened to the spokes in such a way, that it would be impossible for a boy to get his hand between the spokes or to catch a piece of wood in it. At the Trade School, a boy was seen operating a circular saw while the guard was removed from the saw. The gears on the printing press are altogether unprotected.

These matters were called to the attention of the Instructors and guards were placed on the saws. Some steps should be taken to insure the practice of all safety rules observed in commercial shops and factories. The propaganda for "Safety to Workmen" should receive encouragement from the public schools. Manual Training teachers should thoroughly familiarize themselves with safety appliances, rules governing gear key seats, use of emery wheels, emery dressers, etc. Several corporations have a rule to the effect that any person using an emery wheel without first protecting his eyes with goggles will be dismissed at once. It is common practice in the Denver schools for boys to use emery wheels without any goggles whatever. These should be provided at once and boys should be required to use them when working on an emery wheel of any kind. While courts have repeatedly held that schools are not liable for accidents to pupils, suit might be brought against the school if factory laws be disregarded.

No trade arrangements, regarding the work of the school have been made. The carpenters' union has passed resolutions giving full credit on apprenticeship for time spent in the school, but

no arrangements have been made for placing the boys as they come from the school. No arrangements whatever have been made with employers for coming to the school when in need of apprentices or other help. That is to say, that the school has been conducted entirely separate from the industries of the city. There have been no advisory committees appointed from the trade school to suggest courses of study.

We believe that a school fitting boys for advanced standing in the trades as the Denver Trade School is doing, cannot succeed in properly training and placing its pupils unless it is able to secure definite understandings with the trade, approved by all parties in interest, which shall cover all such points as:

1. The amount of credit on apprenticeship which the boy is to receive in the trade for the time spent in the school.

2. The wage which he is to receive as an advanced apprentice when he enters the trade.

3. The conditions upon which the diploma is to be granted after he has done satisfactory work as an apprentice.

4. The use of the school by employers as a first source of supply when taking on new workers.

5. The creation of advisory committees consisting of employers and employes from each trade to advise the school authorities in discharging this task.

In connection with the survey, conferences were held with the Denver Manufacturers' Association and the Trades and Labor Council to see to what extent they were willing to co-operate with the Denver Trade School in definite arrangements to regulate the work of the school and the employment of its graduates. The following memorandum was submitted to these two organizations and the plan which is outlined was unanimously approved by them.

### **Memorandum on Co-operation Between the Trades and the Denver Trade School**

*Colorado is a state of unsurpassed resources, but it manufactures only a very small proportion of what it consumes, altho this proportion is slowly increasing. It is also true that the state is impoverishing itself by shipping out its natural resources in a crude or semi-finished condition. If Colorado, and Denver particularly, are to increase their manufactures requiring skilled labor, they must train workers capable of doing work as well as, or better than any other workman in the country. In this way, the state and city will profit largely by its superb natural advantages. The slogan "MADE IN COLORADO" should designate trained workmen as well as superior goods.*

*The industries must help the schools* if any training they give is to prove effective. Industries cannot today train their help without the assistance of the schools. The schools can do little without the active help of the industries. Those engaged in manufacture in this city need to take an active part in whatever plans for industrial education are adopted in Denver; otherwise, public money will be wasted and the work a failure. For these reasons the following plan of co-operation between the schools and industries was submitted for consideration and approval by the Denver Manufacturers' Association.

### The Plan

1. *Evening Trade Extension Classes.* These classes should be organized into separate trades or occupations and be open only to those already engaged in these occupations. The teaching should be done by persons of skill and experience in the trade or occupation. The purpose of these classes would be to give ambitious and competent men the chance to get the instruction leading to promotion and better wage. At present, no classes of this kind are conducted in Denver. Thousands of dollars are being paid by workmen for correspondence school instruction which should be furnished by the public schools.

2. *Day Classes in the Denver Trade School.* This school may well become a preliminary apprentice school for the trades and industries of the city. Boys going into this school should be carefully selected for their interest in and fitness for the trade. If these boys on completing the course are to find their way into the industries, an understanding should be made with employers in the city that they will come to the school whenever is need of new workers, giving those boys who have completed the course the first opportunity of employment. Boys completing courses should be given credit for at least two years on their apprenticeship for the time devoted to instruction in the school, and should be started at the third year apprenticeship wage. They would be required to serve in the shop the number of years of apprenticeship usually required by the trade, of which two years would be those spent in the Denver Trade School as an apprenticeship school. The diploma of the school should be withheld for one year and until the pupil presents to the school proof of satisfactory service in the trade. An advisory committee composed of employers and employes in the trade should be appointed to aid the school authorities by advice and suggestion in making the work of the school a successful apprenticeship training.

3. *Part Time Classes* which take a portion of the time of the worker weekly or bi-weekly for instruction bearing on his trade or occupation. Public schools should establish such classes whenever requested and a class of 15 persons can be secured. It is recognized that this part time method of instruction must be a matter of slow growth. It must come, however, because part time classes are the way through which most of the youth of the country must be trained. They give a chance for the young worker to earn and learn at the same time. The sooner the industries of Denver learn how to deal with the further schooling of their employes, the more certain will be the material prosperity of Denver in the future.

This was a fair test of the attitude of the trades toward the school and the scheme it proposed for cooperation between the school and the trades. The way seems open for the establishment of definite trade understandings operative in both closed and open shops. The duty and responsibility rest upon the school authorities of Denver to take advantage of this favorable situation at once.

#### *Recommendations.*

1. The entrance requirements of the school should be changed so as to admit boys over 14 years of age who have completed the seventh grade.

2. Attention needs to be given to safeguarding the machinery in a more complete manner.

3. The school should be more centrally located in a plant where it is not handicapped by lack of room and by the confusion resulting from the mixing of trade and manual training instruction for large numbers of high school pupils.

4. Additional courses should be offered in such trades as electrical work, telephony, automobile repair and construction, and machine shop instruction, in the day school.

5. The school should offer evening courses extending the knowledge and skill of men already employed in the industries. It would seem that there would be an immediate demand for such courses in all the building trades, electrical work, telephony, automobile work, machine shop work, interior decorating and acetylene welding.

6. Every effort should be made to develop part time classes in which boys already employed in the trades devote a part of their working time weekly or bi-weekly to instruction in the school.

7. Dull season classes should be arranged for apprentices

from seasonal trades to attend school all day during their dull season.

8. Trade understandings should be worked out for each trade taught in the school regulating the conditions under which the boys pass from their training in the school to advanced apprenticeship.

9. Finally, advisory committees should be appointed composed of employers and employes from each trade to aid the school authorities by advice and suggestion in making the work of the school a success.

### (7)

## The Public Evening School

Evening classes have been conducted in two buildings during the year. The elementary school was held in the Longfellow building and the night school in the Manual Training High School. No other school buildings were opened for evening school work. 1,222 persons were enrolled in the elementary night school, 20% of whom attended less than ten nights. This may be accounted for in a number of ways. Elementary school subjects are often offered in only one building and many persons started the night school, but find that the effort is too great and that going across the city from school requires them to be out too late. Many of them must be at work early in the morning and the late hours make too great a strain for them.

The school is exceptionally well conducted and there is an air of seriousness about the work which is commendable. The pupils seem to see the importance of being on time and of utilizing every minute of the school time.

The accompanying table, giving an analysis of the attendance of the elementary night school, shows the extent of the work and the attendance in each subject.

**TABLE NO. 8**  
**Attendance in the Elementary Night School**

	Cooking	Shorthand and Typewriting	Bookkeeping	English for Foreigners	Common Branches	Sewing and Millinery	Total
Total number admitted to class.	70	171	75	344	463	99	1,222
Average attendance .....	36	69	24	155	225	41	550
Attendance—							
1 to 5 nights.....	7	24	5	41	55	10	142
5 to 10 " .....	5	16	5	39	33	4	102
10 to 15 " .....	5	17	5	41	24	8	100
15 to 20 " .....	8	17	9	27	18	19	98
20 to 25 " .....	10	30	13	26	26	23	128
Over 25 nights.....	35	67	38	170	307	35	652
Number of classes.....	1	2	1	7	9	2	
Number of sessions this year...	92	92	92	92	92	92	



stic ce	Sewing	Millinery	Prepa- ration for Teaching	Spanish	Chemistry	Civil Service	Algebra	Geometry	1st yr. English
	107	38	25	156	34	37	54	28	84
	33	16	14	51	27	15	20	14	42
	15	6	2	8	10	6	13	5	6
	12	9	4	7	10	2	10	4	13
	7	3	2	19	1	5	10	4	9
	15	3	2	17		4	8	2	7
	14	2	3	11		3	1		5
	44	15	12	94	18	17	12	18	44
	4	2	1	14	1	1	2	1	4
	48	48	48	48	46	48	48	48	48



The classes in the common branches show the greatest persistency of attendance. 66% of the students in these classes attended more than 25 nights. The poorest attendance was shown in the sewing and millinery, where only 35 of 99 attended more than 25 nights. The work in these classes was intended for young women who wish to learn to make their own clothes and hats. No regularly organized course was offered, the girls confining their efforts to the making of clothing and hats for themselves.

59 classes, with a total registration of 2,504 persons in all subjects were organized and conducted in the night high school. With a very few exceptions, the classes were given work of high school grade, and credit toward a high school diploma was given to those persons completing the courses in a satisfactory manner. The following table gives an analysis of the attendance upon evening classes. It should be noted that only one class, that in the advanced electricity, was conducted as a trade extension class. The membership of this class was restricted to persons who had had some experience in electrical work. It will be noted that the attendance in this class was exceptionally good.

All teachers in evening schools are paid \$2.50 a night, irrespective of the subject taught. Principals receive \$75.00 a month for seven months, of which one month is given for preparation. Practically all of the evening school instructors are selected from the force of day school teachers. For six months of the year such teachers are engaged in teaching both day and night, usually for four days of each week. While the use of day school teachers for evening school subjects, in many cases at least, seems unavoidable, the fact remains that it represents an exhausting ordeal for them.

The list of subjects offered in evening commercial classes needs to be enlarged. The present list includes instruction in only what might be called the mechanics of office work, such as penmanship, typewriting, shorthand, business English, and arithmetic. The experience in other cities shows a very great need for promotional classes for ambitious commercial workers in such general business subjects as salesmanship, advertising, principals of accounting, retail merchandising, business economics, commercial law and modern business methods. The success of the Y. M. C. A. of Denver, with similar courses, demonstrates the demand.

Thus far there seems to have been little effort to supply real industrial or trade classes in evening school. They have been rather general improvement classes in which all who applied have been enrolled, ranging from numbers of novices 15 or 16 years of age, to a few persons coming from trades. These classes in such subjects as joinery, forge work, electricity, turning, roof-framing, sewing and millinery have been taught by persons in most cases with no trade experience in the trade. The attempt to teach novices and trades people in one and the same class has not proved very successful anywhere. Not only has this been the case, but the wage-earners who came to the school, usually came from a wide variety of occupations; in some cases practically none of them from the trade which was being taught. It is not strange that with these conditions the evening high school, with a total registration in all subjects of 2,508, had an average evening attendance in all subjects of 845, or one in three.

There can be no doubt that many classes in the evening high school are doing good work, by which their students have been benefitted. The point which needs emphasis, however, is that so far as industrial or trade instruction is concerned, of a definite wage-earning kind, the evening high school is in the same position as the day high school. Both institutions should

recognize that there is a rich field which they have not entered, where the prospective students are almost as great in number as those now being enrolled. Both must, in order to reach these new students, add to their present courses additional ones which will directly aid in successful wage-earning.

Wage-earning adults, if they come to evening school, come because they wish to supply their immediate needs. The immediate need, of which they are most conscious, is that of *greater wage-earning power*. Consequently, the instruction for them should be direct and should bear upon the kind of work which they are doing, fitting them for greater efficiency and promotion. They are not interested in long, general courses in engineering or mathematics or science or drawing. Undoubtedly, there is a place in evening school for such courses which should be open to all. But these wage-earners want courses which will teach them things in the shop or in the class room, in applied mathematics, science or drawing or skill in process, which they can understand or use either in their present or future work as their avenue to promotion.

Evening classes for trade workers of this character are usually called trade extension courses because they extend the trade skill or knowledge of the worker. The classes should be organized by separate trades. Novices should not be admitted to classes of this kind, as it is impossible for them to profit by instruction relating to practical trade problems and processes about which they know nothing. Their presence in the class prevents the proper instruction of the student in the trade. Novices should be dealt with in separate classes.

Where the resources of public evening industrial classes are limited, it would seem advisable to lay special stress upon the effort to meet the needs of those already employed in occupations whose demands they seek to serve. All experience seems to show that the further training of wage workers along the lines of their vocation, brings better returns in the evening school than the attempt to give novices any considerable amount of trade training in the hundred hours usually given to evening classes, strung out over a period of six months.

The instruction in these trade extension classes should be arranged in a series of short courses, such as carpenters' arithmetic, carpenters' drawing, blue print reading and estimating, roof-framing and stair-building.

These unit courses, ranging from ten to thirty lessons each, should be arranged so they follow rather than parallel each other, in order that the student may take all of them, which

he should be urged to do, or any one or more of them, for which he feels the need. The Minneapolis Survey and the conferences held in Denver, show a practically unanimous feeling among both employers and employes, that the evening trade extension organized in short units as above described, are the only classes which will meet the situation in the trades.

These courses, whenever possible, should be given in evening classes at the Denver Trade School, rather than at the evening high school. The Trade School should be made the center of all trade instruction as far as its facilities and room will permit. Here again difficulties present themselves. The school is too far removed from the center of the city to serve this purpose well for workers in other sections. The school lacks not only adequate room, but shop facilities for any other trades than the three now given—printing, plumbing and carpentry. The machine and wood shops and the acetylene welding plant at the Manual Training High School could be used, and classes in other than shop work could be accommodated in various parts of the city.

Instead of engaging instructors for the entire school year, to teach a subject, instructors, expert in the particular subject they teach, should be engaged for the various short courses.

### **Recommendations Regarding Evening Vocational Classes**

1. It may well be doubted whether in the cases of some teachers at least, continuous employment at day and evening instruction is best for their health and general efficiency.

2. Classes in all such promotional subjects as salesmanship, advertising, commercial law, retail merchandizing, accounting, business economics and business ethics should be added to the present evening classes, which deal with only the mechanics of office work.

3. The city can spend to best advantage most of the money in evening industrial work in trade extension classes, extending the knowledge or skill of men already employed in the trades.

4. These evening trade extension classes should be organized by separate trades. The teachers should have special knowledge and ability in the trade subject taught. Each course should be definite and directly bearing on specific problems of the trade, making the aim of each lesson to add a new wage-earning asset to the student.

5. The Denver Trade School should be made the center of this evening trade instruction. As has already been



pointed out, this school needs a more central location, more facilities and larger quarters.

6. To secure competent men from the trades as instructors, it will be necessary to arrange a new schedule of pay for them at least.

## (8)

### Commercial Work in the Public Elementary High and Evening Schools

Introductory bookkeeping has been placed in the eighth grades of nine elementary schools. Penmanship, spelling and arithmetic are also emphasized in connection with this work. Typewriting by the touch method is also taught to the eighth grades of five elementary schools, and the theory of Gregg shorthand is presented to a limited number of pupils in two schools, but the latter subject has been discouraged so far.

The time devoted to these commercial subjects varies, but approximately thirty minutes three times a week is given to it. In some instances this commercial work supplants certain special subjects like art, music and German, but generally it is an extra assignment outside of school hours—at noon and before or after school. The teachers state that “the pupils are so anxious to receive the instruction, that they gladly adjust themselves to any arrangement proposed by the teacher.”

We doubt the vocational significance of this training given for only an hour and a half a week to children who have not finished the eighth grade. We believe, however, that it is most excellent prevocational experience which will interest and awaken pupils and help them to discover whether they are adapted to some line of office work. In any scheme of prevocational training, either in the upper grades of the elementary school or in a junior high school, opportunities of this kind should be offered. Furthermore the introduction of this work into the elementary school, where it has met with the interest of many pupils, points unmistakably to the need for the introduction of shorter thorough-going commercial courses in the earlier years of the high school.

#### *Recommendations.*

1. The commercial instruction of the elementary schools needs to be encouraged, but it also needs to be organized and systematized.

2. There should be more definiteness and uniformity in what is taught and how it is taught.

3. The work should be accorded a regular place in the course of study, and conducted systematically, or eliminated altogether.

4. Commercial training in the elementary schools should be given largely for the purpose of interesting and awakening boys and girls so that they may learn whether they are fitted for office service.

The commercial course in the Denver High Schools is four years in length. During the first year the pupil gets instruction in penmanship, spelling, business forms and arithmetic for forty minutes a day, the remaining time being devoted to regular high school subjects which are prescribed. In the second year the amount of time is increased to eighty minutes a day, which is given to bookkeeping, typewriting and penmanship, the remaining time being spent with regular high school subjects, some of which are prescribed and some elective. In the third and fourth years 120 minutes or two hours is given to commercial subjects, which, in addition to the foregoing, include stenography, commercial law, banking and office practice, and economics.

There can be no doubt that this course is on the whole very well adapted to the interests of a group of boys and girls who have four years to give to preparation, and every pupil desiring training for commercial work should be encouraged to take it. There is, however, another very large group who must get their training, if at all, in less than four years. How large this group is, is shown by the fact that there were in the private commercial schools in day work last year, 1,212 pupils, a group almost as large as the total number enrolled in the freshman year of all the high schools of the city, and that approximately \$150,000.00 was paid out in the year for this training.

Many boys and girls do not take the commercial course of the high school because, in addition to requiring too many years, it does not offer training for effective wage earning in office work in the first and second years, at the close of which they must go to work. They want stenography, because the modern office demands it, yet the present course does not offer it until the third year. They want bookkeeping, yet they cannot get it the first year, and in the second year only forty minutes a day is given to it out of a five-day week. So with typewriting. The work is intensified in the third and fourth years, but they do not remain to benefit by it. The whole course has been arranged on the theory that every pupil could or should spend four years in the high school

before going into office work, when only about 21 out of every 100 enrolled in the eighth grade ever reach the fourth year of the high school, and more than eight out of every ten people in commercial work are not high school graduates. The school should offer opportunities for instruction in business English, civics, principles of accounting, commercial law, business economics, salesmanship and advertising.

At present the high schools of the city have no equipment except typewriters and one mimeograph located in one of the high schools. The modern office devices suggested above are just as necessary to the proper equipment for commercial work of the four year as of the two year pupil.

The greatest deficiency in high school commercial courses in general, is that the subjects of bookkeeping, commercial geography, shorthand and typewriting are taught as isolated subjects and not as an organized preparation for actual participation in business.

The stenographer must know how to prepare a letter, address the envelope and place them together, ready for the signature. She must also understand how to file carbon copies so that they are readily accessible. She must understand the preparation of telegrams, night letters, etc., the filing of invoices, etc. If this knowledge is to be acquired in the high school business courses, provision must be made for the student to get a real experience in such work.

The school should provide the opportunity for the student to have experience in the taking of dictation, transcribing of notes and the preparation of letters and other documents. This may be done by assigning each student to a member of the faculty for the purpose of doing the correspondence work of the teacher. The student should be required to prepare the work for teachers, returning it in a finished condition ready for signature or for actual use.

The best way to do this is through actual office experience under some plan by which the pupils, before graduating, serve in the office of the board of education, the various school buildings and business concerns,

One of the most important commercial lines, because of the large number of people employed in it and the opportunities for good wage and promotion, is that of salesmanship. The United States census reports for 1910 state that there are engaged in salesmanship work in Denver the following:

**TABLE NO. 10**  
**Occupations in Salesmanship, Denver, 1909-10**

Commercial Brokers .....	220
Brokers and Promoters.....	160
Clerks in Stores.....	2,360
Commercial Travelers .....	1,118
Floor Walkers and Overseers.....	168
Insurance Agents and Officials.....	509
Real Estate Agents and Officials.....	1,403
Retail Dealers .....	4,557
Sales Agents .....	151
Sales Men and Women.....	450

making a total of 15,000 engaged in selling occupations, not including a large number listed as wholesale dealers, store employes, coal men and persons in similar occupations. It will thus be seen that salesmanship is the largest single occupation in Denver.

The opportunities for promotion and good salary in salesmanship are greater than in most occupations. A fairly large number of persons engaged in selling are receiving annual salaries between \$5,000 and \$10,000. This is considerably greater than salaries paid to stenographers, bookkeepers, etc., but the public schools have as yet made no effort to train persons for such occupations. The old idea that a salesman is born and that he cannot be taught, is giving way to the demonstrated fact that selling ability can be developed through training and experience. The need for such training is demonstrated by the fact that several of the large department stores are conducting salesmanship schools of their own. It is true that some of these schools find the necessity to teach the common branches of the elementary school, but they offer an additional course in salesmanship for both beginners and experienced employes.

The Denver Retail Merchants' Association unanimously approved of a plan for introducing salesmanship training into the Denver public schools and readily agreed to do all within its power to assist such courses when introduced. The aim of the plan is to secure these results: First, to attract the attention of competent young people while in the public schools or afterwards to the desirability of salesmanship as a life work. Second, to attract promising young people to salesmanship work. Third, to give them and the stores which they serve, training, which will be valuable to them in their work as salesmen.

Three different ways of accomplishing these purposes were proposed: First, previous courses in different phases of salesmanship should be offered as elective to the students of the commercial course of the high school. If the high school conducts both a two year course and a four year course in commercial work, some training

in salesmanship is to be offered to all the students in these two courses, who desire to take it, so that when they go into Commercial work, especially in stores, they will have some understanding of the problems connected with the sales of goods, so that promotion along salesmanship lines may be opened to them. Second, a special course in salesmanship, one year in length, should be opened to those students in the high school who have only one year more to spend in the high school and who desire to fit themselves as wage earning salesmen. Third, free evening classes in salesmanship should be opened to all salesmen who desire such instruction. These classes are to be conducted in the public schools at the public expense. A course of study is to be developed in consultation with merchants of the city. The teachers of the work are to be persons who have had practical experience as sales people as well as in special preparation to give instruction.

The plan for organizing and administering the courses includes these features: A special advisory committee on salesmanship work, composed of persons engaged in merchandising appointed by the school board. This committee is to assist the school authorities by advising and suggesting points in the work of salesmanship. The merchants of the city agreed to employ as their first source of supply in seeking help, young people who have completed courses in salesmanship in the high school. These young employes are to be paid a beginning wage of not less than 25% more than that paid to beginners without this training. In the case of the graduates of the special course in salesmanship, the certificate or diploma of the school is to be held at least one year and until the student is able to furnish proof of satisfactory service as a sales person. In order that the training in salesmanship may be made practical and effective the merchants agreed to give opportunity in their stores for the high school students in salesmanship to get actual experience in selling goods, which will help them while carrying on the course in the school. During part of the school year, they will arrange to give the students part time work in their stores. The merchants also agreed to encourage their employes to attend free evening classes pertaining to salesmanship, and other things being equal, to recognize this attendance in the promoting and retaining of sales people.

#### *Recommendations.*

1. There should be a two years' course of commercial training in the high school open at any time to any pupil who has finished the eighth grade.

2. Each year of this course should be a unit in itself so that if the pupil withdrew at the end of the first year, he would carry with him definite knowledge and skill in doing something that the commercial world wants done.

3. The high schools should be equipped to give pupils familiarity in the use of all those devices and appliances usually found in the modern business offices.

4. Opportunities should be provided in the offices of the school board, the various schools of the city and various business offices for actual experience in office practice for the commercial student before graduation.

5. Salesmanship should be added to the list of high school subjects open to all students, but particularly to commercial students.

6. The commercial work of the high schools is of such large and growing importance that it needs to be organized into a separate department, under a distinct head, and with a separate organization of subjects, pupils and teachers.

### (9)

## **Cooking in the Public Elementary and High Schools**

There is no organized department in the Denver schools for teaching home making. In nearly all cities, such a department is conducted under the name of "Home Economics," "Household Arts" or "Domestic Economy." In Denver there is a cooking department in the elementary and high schools. This work is under the direction of a supervisor, who has charge of the work in both elementary and high schools.

Cooking is taught to all girls in the eighth grade and to as many girls in the seventh grades as can be accommodated in the classes by the present teaching force. Each class has 120 minutes a week of instruction in cooking. Seven teachers devote all their time to teaching cooking in the elementary schools.

Seven elementary schools are furnished with domestic science kitchens. These kitchens are not equipped as a kitchen in a home would be, but are provided with long tables on which are placed gas burners, and each girl is assigned to one small stove and a complete equipment of kitchen utensils for her work.

A large majority of the lessons consist of the cooking of a fraction of a recipe of some one article of food. Meals are not prepared except on rare occasions, and then the planning is all done by the teachers. No laundry facilities are provided or any other home appliances, so that work is entirely the preparation of food.



During the years 1914 and 1915, the total cost of cooking in the elementary schools was \$7,888.52, of which \$5,809.43 was for salaries of supervisors and teachers of elementary cooking.

The domestic science teaching is of a high order. The teachers are well prepared to give the instruction and are faithful and conscientious in their work. The weaknesses in the work are those due to its organization, equipment and general policy, rather than to the character of the instruction. As the purpose of the instruction is vague and indefinite, it is impossible to give definite and consistent instruction leading toward the end in view.

If the purpose is to teach the girl to be a good cook, the instruction should include vastly more than the cooking of fractional recipes of one article of food at a time. The preparation of a meal involves much more than the mere cooking of one or two articles of food. It requires considerable planning, in addition to the knowledge of the methods of cooking individual dishes, to start each article cooking at the proper time, watching it to see that it cooks properly, and so timing each step that the meal will be ready to serve, all at the proper time.

Some provision should be made for girls to cook complete meals and have practice in serving them properly.

In every city there is a growing demand for "accommodators," girls who can prepare and serve dinners, teas, suppers, etc. Such girls must know how to plan a menu, to properly set a table, to serve course dinners and to rearrange the kitchen in order. This requires a knowledge of buying and a considerable knowledge and familiarity with fashionable setting of tables, arranging of silverware, etc.

Girls who are prepared to do this work will find ready employment at good pay. Every city has a large number of women who would be glad to employ competent people for such work. No capital is required on the part of the girl, and the knowledge gained will be of service to her in whatever work she may eventually enter. In nearly every college town there are opportunities for girls to work their way through college, doing such work evenings and at times when school is not in session.

### *Recommendations.*

1. We feel that training of girls for the proper discharge of home duties is so important that there should be a department of home economics or household arts, which should include both elementary and high schools, and should cover not only cooking and sewing, but in addition all such things, equally in-

portant, if not more so, as sanitation, first aid to the injured, care of the sick, home decoration, garment making and costume design.

2. More time should be given to the work, even if this requires a longer school day.

3. Here again the intermediate or junior high school would give opportunities not otherwise afforded.

4. The training in home economics in both elementary and high school should be under the direction of a supervisor for the entire city, so as to unify the work.

5. There should be a closer correlation between the work in home economics and the art work in elementary and high schools, under a plan to be worked out by the supervisors and approved by the superintendent.

## (10)

### **Art and Drawing in the Elementary Schools**

Instruction in art and drawing is given in all grades of the elementary schools. Ninety minutes, three half-hour lessons each week, are devoted to the subject. We feel that better results would be accomplished in the upper grades, if the full ninety minutes were given in one period of instruction. The teaching is done by the regular grade teachers, under the direction of a competent supervisor.

There is no connection between the supervision of the art work in the elementary schools and that given in the high schools where the teachers in the different high schools work independently of each other and of the elementary art supervisor. The lack of a supervisor for all the art work of all the schools prevents the continuity of purpose and unity of action which in our opinion is necessary.

Practically all the art work of the public elementary schools of the country, is what might be called graphic art, where the pupil is taught to represent ideas with pencil, crayon and brush on paper or other flat surface. In our opinion the art work of the elementary schools should have the two-fold aim of raising the taste of the pupils not only in pictures and other products of the fine arts, but also in their choice and use of the goods of life which are the products of the applied arts, such as garments, hats, carpets and rugs, furniture, tapestry, linens, laces, shoes, home decorations, etc. The absolute divorce from the art work of the home economics and manual training departments prevents the application of the principles learned in the art class to the practical activities in any effective fashion.

Furthermore, the absence of any organization and scheme whereby pupils may have the opportunity to work out the designs they have made in an appropriate material, makes the work seem unreal and artificial and deprives some pupils of the opportunity of discovering and developing the special ability in the applied arts.

There is no administrative relation between the art department, the cooking department, the girls' handicraft department, and the manual training department. Each is as separate and distinct as though they were in different cities.

If the art work is to be of any great benefit to the children, it should be closely related to all their constructive and creative activities. The designing of projects in manual training or sewing should be a part of the work of the art classes. At least the lessons learned in the art class should be applied in the constructive work.

### *Recommendations.*

1 There should be a supervisor of art work of all the schools of the city to properly organize this work in one department.

2. Some scheme of correlation should be worked out by the supervisors of art and drawing, household arts, and manual training in the schools which, when approved by the superintendent, will be used to secure the application of designs in the appropriate materials. In this way only can proper training in the applied arts be secured.

(11)

## **Art and Drawing in the High Schools**

Courses in drawing are given in each of the four years of the regular high school. The student may take free-hand and mechanical drawing in the first two years, design or mechanical drawing in the third year, and free hand drawing and design or mechanical drawing in the fourth year. All first-year pupils are required to take instruction in free-hand and mechanical drawing. The work of the second, third and fourth years is elective. The course of study as printed in the annual prospectus of the high schools follows:

### **DRAWING.**

#### **Free-hand and Mechanical.**

(For credit in Academic Course)

#### **Required.**

IX and X; 1 and 2.

*Free-hand*—Nature-studies with pencil; cast-drawings with

charcoal; still-life studies with pencil, pen and ink, charcoal, colored crayons, pastel and water-color; history of Art. The principles of perspective are emphasized by drawing corners of a room.

*Mechanical*—Free-hand lettering; practice exercises to develop facility in use of instruments; geometrical problems; working drawings or tracing and blue-printing of simple machine or architectural drawings.

### Design or Mechanical Drawing.

Elective.

XI; 1 and 2.

*Design*—A limited number of problems, simple and practical, covering as wide a range of subjects as possible; for example:

1. A line design for a square.
2. A series of small designs for the division of different shapes (circle, square, oblong, etc.) into pleasing space relations.
3. Geometrical design for circle or square.
4. A unit, using a conventionalized flower-form, to be repeated as a border or as an all-over pattern.
5. An illuminated motto.
6. A more ambitious design to be stenciled or worked in leather.

### HIGH SCHOOLS.

Pictures and the stereopticon are used to show masterpieces in painting, sculpture and architecture and to emphasize the fact that the same principles of design govern all good ornament, whether it be for the facade of a cathedral or for a match-box.

*Mechanical*—Working drawings made from free-hand sketches of objects. Elementary machine drawing; tracing and blue-printing; conic sections and higher plane curves; projections and developments.

### Free-hand Drawing and Design or Mechanical Drawing.

Elective.

XII; 1 and 2.

*Free-hand*—Advanced work in various mediums, the aim of this work is to enable students to understand the meaning of pictorial art. Form, values, composition and color harmony are studied in connection with still-life groups, pose-drawing and out-door sketching. The needs of individual pupils are specially considered.

*Design*—Historic ornament, including a series of problems in each of the great historic styles, with rigid adherence to their essential character. Occasional practical application of decorative composition to posters advertising school events, program covers for graduating exercises, etc.

In both Grade XI and Grade XII it is designed to make the pupils familiar with the masterpieces of art in all ages, with special reference to the great mural paintings in the public buildings of the United States. Articles on these subjects in the current magazines are read to the pupils and recommended for home reading. Talks on art subjects, illustrated by the stereopticon, are open to all students.

*Mechanical*—Preparation of sheets by stretching; advanced machine drawing; architectural drawing; tracing and blue-printing; the first seventeen theorems of Church's Descriptive Geometry, with practical application of the same to problems, may be elected by students qualified for this work.

We believe that the art and drawing work of the high schools should have these purposes:

1. To discover and develop special talent in what might be called pictorial art, the representation of tasteful and beautiful things with paper, canvas, clay or other material and pen and brush.

2. To discover and develop special talent in what might be called applied art, the designing and the making of useful things, such as furniture and clothes that are tasteful and pleasing in form, color, finish and adaptability.

3. The use of drawing as a device, a tool in trade with which the student in after life may be able to plan and represent things to be made either by himself or others.

4. The appreciation, selection and use of better and more tasteful things as citizens and consumers in all the goods of life, including such things as wearing apparel, home and office furnishings and decorations as well as pictures and statuary.

It is from the standpoint of the foregoing aims that these suggestions are made concerning the art and drawing work of the high schools.

The present course seems to be very well adapted to the ends of promoting better taste in the appreciation of what might be called pictorial art—the best things on canvas and in clay and stone. It will probably compare favorably in its results with the work of other large high schools in the discovery and training of those with special artistic ability. Moreover, the course as a whole corresponds very closely to those offered in other

high-grade schools in the country. It is from the standpoint of the other two of the aims proposed above that these courses are open to criticism.

The course as outlined on foregoing pages does not deal with applied design save in its application to printing where "occasionally practical application (is made) of decorative composition to posters, advertising school events, program covers for graduating exercises, etc." The total lack of printing work in all save the Manual Training High School and the very elementary character of the equipment there prevents the correlation between the design and its execution necessary to the most effective teaching. In the high schools where no manual training is taught there is no opportunity for the execution of the design in the appropriate material. In the two high schools where manual training is taught, there is absolutely no connection between the art and drawing and the manual training shops where designs could be worked out in the joinery, turning and molding, pattern making, forging and machine shop work. So far as the prospectus indicates, there is little connection between the art work and the home economics work in sewing, costume design and household decoration, dressmaking and millinery. Nor is there any connection between the art work of the schools and any of the art trades of the city, such as art glass, photo engraving, lithography, photography, furniture or cabinet making, architecture, dressmaking, millinery and interior decorating.

This lack of close correlation with the shop work is just as marked in the case of the mechanical drawing classes. Nowhere does the printed course of study provide either for the use of actual shop problems from the manual training work as subject matter for the drawing class or for the making of any drawings for use in the shops. The grouping of pupils is such that not only may those from different shops take drawing together, but those not pursuing shop work may also be taught with those who are. This tends to make the mechanical drawing work artificial and theoretical.

The printed course of study states that the aim of this work is to enable students to understand the meaning of Pictorial Art. If the high schools of Denver are to prepare all the young people of the city to do the work which they must do and live the lives which they must lead, it is difficult to understand why all students should be required to take a subject whose purpose is to understand the meaning of Pictorial Art, any more than to understand any language, such as French, German or Spanish. The matter of requiring any subject in the high school is a serious one.



One of the greatest deficiencies of American people is their lack of taste in the choice and use of articles with which they adorn their persons, their homes and their buildings. The matter of developing taste is not one, however, of understanding the meaning of Pictorial Art. Neither is it a matter of ability to express an idea with pen or brush.

Modern industry requires designers who can design beautiful products which can be manufactured and sold. A large proportion of the population must choose from products which are offered by stores and shops. Therefore, to choose and secure artistic products, to be able to offer them to the buying public, stores and shops must employ persons who can execute artistic ideas *in materials*.

The purpose of some of the art courses in the high schools should be to develop taste which will manifest itself in the lives of the students in the choice of home furnishings, in dress and in the things with which they surround themselves. This development of taste and appreciation is not dependent upon technical skill in the use of pen or brush. It must come through a knowledge of materials, workmanship and design. It need not be the ability to execute designs, but of selecting them. One can appreciate a symphony without having any skill or ability in composing one.

Opportunities should be afforded in the high school for young people with unusual artistic talent, to specialize in art work. If they wish to become commercial designers, they must be afforded opportunity to design in materials. The kind of design which will be needed by the designer of printing will be entirely different from that of the person who is to design art metal work or textiles, or machinery.

In other lines of work, we have learned that there is no general disciplinary training which can be given to the pupil and later applied to anything and everything. In music, the training given to the clarinetist is entirely different from that of the pianist, and both are different from that given to the violinist. In industrial work, the training given to the printer is different from that given to the machinist or shoemaker. This to say, that modern industrial establishments require persons with particularized training, particularized habits of execution, rather than generalized habits. Our art training cannot be given on the old formal discipline theory, any more than languages and history can be given on that theory.

Girls studying home decoration do not need so much the

portant, if not more so, as sanitation, care of the sick, home decoration, garment design.

2. More time should be given to the work which requires a longer school day.

3. Here again the intermediate or junior high schools should give opportunities not otherwise afforded.

4. The training in home economics in the high school should be under the direction of the entire city, so as to unify the work.

5. There should be a closer correlation in home economics and the art work in elementary schools, under a plan to be worked out by the superintendent approved by the superintendent.

(10)

## Art and Drawing in the Elementary

Instruction in art and drawing is given in elementary schools. Ninety minutes, three times each week, are devoted to the subject. We feel that results would be accomplished in the upper grades if ninety minutes were given in one period of instruction. Teaching is done by the regular grade teachers, with the supervision of a competent supervisor.

There is no connection between the supervisory work in the elementary schools and that given in the high schools where the teachers in the different high schools are entirely of each other and of the elementary art schools. Lack of a supervisor for all the art work of all the schools prevents the continuity of purpose and unity of action. A supervisor's opinion is necessary.

Practically all the art work of the public schools of the country, is what might be called graphic. The pupil is taught to represent ideas with pencil or brush on paper or other flat surface. In our opinion the work of the elementary schools should have the tendency of raising the taste of the pupils not only in pictorial products of the fine arts, but also in their choice of the goods of life which are the products of the applied arts—garments, hats, carpets and rugs, furniture, table linens, shoes, home decorations, etc. The absolute separation of the art work of the home economics and manual training departments prevents the application of the principles learned in the art class to the practical activities in any effective manner.

work, if it is to be beneficial to the work in sewing and cooking, should be given in close relation to these departments.

In high schools, the girls taking sewing and cooking and manual training are all expected to take the art course. There is no connection between these departments. A boy taking furniture work or machine-shop work should have the same art training as the girl studying interior design or costume designing. If these departments are to be given to boys and girls for specific work, the art and drawing should be given as related to that work and not as separate subjects.

### *Recommendations.*

Art should not be made a required study for the high school upon all students. There is no more sense in requiring all freshmen to take art than for one requiring all freshmen to take music.

Mechanical drawing should be required for boys taking manual training or the work of a more advanced course, should one be established. At least some work should be required. At the same time it should be given for elective work in applied design. Household arts activities of the high school should give at least two years' work to applied design. Opportunity should be open for them to take work in advanced design or in free-hand and mechanical drawing. This free-hand and mechanical drawing should be separate from the boys and should not be required, but should get quickly into the problem of home building and home decoration. The design should deal with the problems of interior design, costume design, home furnishings and

There should be closer correlation between the mechanical drawing and the shop work. At present there is practically no connection. Boys should draw the things they are to make in the shop. Otherwise drawing becomes almost a useless use and results as general mathematics. The designs which are made in the classes in designing should be executed in the appropriate material. The designs should be so used. In applied design certain general principles of all good design should be taught, due to the nature and limita-

ability to draw curtains, draperies, rugs, etc., but the ability to choose intelligently and with taste from the selection offered in accessible markets. Costume design is not so much the ability to draw costumes and represent them in colors, but the ability to take available materials and put them together in pleasing combinations on a figure. Design for printing does not demand ability to draw with charcoal, plaster casts or perspectives of buildings.

If art is to find its way into industry, and it will only be through the acceptance by industry of appreciation of the beautiful that we will ever secure artistic things from industry, it must enter into industry through the organization that industry has set up. Art schools must recognize present-day conditions and must train its students to meet them.

The comparatively few persons who have exceptional taste and artistic ability must be trained to produce artistic things. In doing this, they must acquire a familiarity with industrial and commercial practices and processes. The man who designs printing must understand type and its use. The man who designs textiles must understand how textiles are made and must make his designs such that they can be executed on modern weaving machinery. The man who designs machinery must understand the use of the machine and so design it that the pattern maker can make the pattern, the foundry man cast it and the machinist finish it. In other words, the designer must have taste, plus a knowledge of technical processes.

The large mass of the population needs an artistic training of a different sort. They need an ability not to execute and design, but to appreciate and select. This does not, as is sometimes implied, involve the ability to execute. A person with no hands or who is paralyzed can appreciate and love beautiful things. It will be impossible for the masses to acquire even a superficial knowledge of the construction of all those things which they must select and purchase—hats, coats, shoes, home furnishings, office furnishings, automobiles, etc., etc.

There is absolutely no connection between the art, manual training and sewing work of the elementary schools and the high school. The work in the high schools is not organized under a supervisor or head of department, although there are supervisors of manual training, sewing and cooking in the elementary schools. The work of these departments is as separate and distinct as though they were conducted in different cities. The cooking department is the only one in which the same person has charge of the work in both the elementary and high schools.

The art work, if it is to be beneficial to the work in sewing and manual training, should be given in close relation to these departments.

In the high schools, the girls taking sewing and cooking and the boys taking manual training are all expected to take the art work, yet there is no connection between these departments. For example, a boy taking furniture work or machine-shop work will receive the same art training as the girl studying interior decorating or costume designing. If these departments are to prepare boys and girls for specific work, the art and drawing work must be given as related to that work and not as separate and distinct subjects.

### *Recommendations.*

1. Drawing should not be made a required study for the first year of the high school upon all students. There is no more reason for such a rule than for one requiring all freshmen to take penmanship exercises.

2. Free-hand and mechanical drawing should be required of all students taking manual training or the work of a more thorough technical course, should one be established. At least three years of such work should be required. At the same time opportunity should be given for elective work in applied design.

3. Girls in the household arts activities of the high school should be required to give at least two years' work to applied design, and the opportunity should be open for them to take elective courses either in advanced design or in free-hand and mechanical drawing. This free-hand and mechanical drawing work for girls should be separate from the boys and should not deal with machine design, but should get quickly into the problems of home planning, home building and home decoration. The work in applied design should deal with the problems of dressmaking, millinery, costume design, home furnishings and home decoration.

4. There should be closer correlation between the mechanical drawing work and the shop work. At present there is practically none. Students should draw the things they are to make and execute them in the shop. Otherwise drawing becomes almost as abstract in its use and results as general mathematics.

5. The designs which are made in the classes in designing should as far as possible be executed in the appropriate material. At least the best designs should be so used. In applied design there is in addition to certain general principles of all good design, another set of requirements due to the nature and limita-

tions of the material in which it is executed. Only by seeing the design worked out in its material, such as paint, wood, clay, plaster, metal, etc., can the student come to understand these requirements of the different art trades, either as a help to him in selecting an art trade he wishes to follow or preparing to meet its demands.

6. There is need as well of an entirely different kind of art course in the high school, the purpose of which would be to train the youth to a more intelligent appreciation of what is good form, color, finish, taste, if you please, in the selection and use of the things which surround him or her and go to make up his environment, such as clothes, shoes, hats, houses, furniture, carpets, tapestry, lace, fixtures, wall decorations, pictures, statuary, landscape gardening, office furniture and furnishings. This course in appreciation might well be given separate to boys and girls. What is needed in this course is not drawing or design or skill in representation, but the illustration of fundamental principles of taste by pictures, stereopticon, objects, models and visitation, which will give the student the power and the habit of applying them to all the commodities of his life.

7. There should be a supervisor of art and drawing, having general charge of the work in both elementary and high school. The custom which has grown up in Denver of giving the elementary school activities supervision, but relieving the high school of it, is in our opinion not conducive to the best results.



### III.

## WHAT PRIVATE AGENCIES ARE DOING FOR VOCATIONAL EDUCATION

The survey undertook to secure accurate information in regard to the vocational education being given by private agencies, which it was hoped to tabulate and present in the form of a chart, giving detailed information as to courses, entrance requirements, length of course, number of students, charges for tuition and total receipts. It was found impossible to do this because some of the private schools of the city refused to give the information asked for, although in most instances the owners did so with courteous frankness.

Sufficient information, however, was gathered from all the private schools of the city to furnish a broad, but at the same time reliable picture of the situation. It was found that approximately \$275,000 a year is being spent in Denver for private instruction in vocational subjects of one kind and another. Of this amount \$146,050 was collected last year by six business colleges, whose tuition for day school work ranged from \$75 to \$180 a year for each student, and whose evening school tuition ranged from \$20 for six months to \$5 a month.

It was found impossible to secure any information from the correspondence schools, but estimating from the returns gathered in a previous survey in Minneapolis, the relative size of the two cities and the number of solicitors employed, it is safe to say that not less than \$25,000 is collected annually by these schools for instruction by correspondence from the wage earners of Denver.

Not less than \$25,000 a year is being collected by private schools operated for profit other than business colleges. Of this amount, one institution gets \$18,000 for preparing 300 students a year at the rate of \$60 for four months per pupil, to meet the civil service examinations given in the district.

Of the other four schools just mentioned, one is a tailoring college, one gives instructions in telegraph and railroad work, one is a Moler Barber College, and the last, opened in January, gives instruction in practical and commercial art, including cartooning, design, illustration and mechanical drawing.

tions of the material in which it is executed. Only by seeing the design worked out in its material, such as paint, wood, clay, plaster, metal, etc., can the student come to understand these requirements of the different art trades, either as a help to him in selecting an art trade he wishes to follow or preparing to meet its demands.

6. There is need as well of an entirely different kind of art course in the high school, the purpose of which would be to train the youth to a more intelligent appreciation of what is good form, color, finish, taste, if you please, in the selection and use of the things which surround him or her and go to make up his environment, such as clothes, shoes, hats, houses, furniture, carpets, tapestry, lace, fixtures, wall decorations, pictures, statuary, landscape gardening, office furniture and furnishings. This course in appreciation might well be given separate to boys and girls. What is needed in this course is not drawing or design or skill in representation, but the illustration of fundamental principles of taste by pictures, stereopticon, objects, models and visitation, which will give the student the power and the habit of applying them to all the commodities of his life.

7. There should be a supervisor of art and drawing, having general charge of the work in both elementary and high school. The custom which has grown up in Denver of giving the elementary school activities supervision, but relieving the high school of it, is in our opinion not conducive to the best results.

### III.

## WHAT PRIVATE AGENCIES ARE DOING FOR VOCATIONAL EDUCATION

The survey undertook to secure accurate information in regard to the vocational education being given by private agencies, which it was hoped to tabulate and present in the form of a chart, giving detailed information as to courses, entrance requirements, length of course, number of students, charges for tuition and total receipts. It was found impossible to do this because some of the private schools of the city refused to give the information asked for, although in most instances the owners did so with courteous frankness.

Sufficient information, however, was gathered from all the private schools of the city to furnish a broad, but at the same time reliable picture of the situation. It was found that approximately \$275,000 a year is being spent in Denver for private instruction in vocational subjects of one kind and another. Of this amount \$146,050 was collected last year by six business colleges, whose tuition for day school work ranged from \$75 to \$180 a year for each student, and whose evening school tuition ranged from \$20 for six months to \$5 a month.

It was found impossible to secure any information from the correspondence schools, but estimating from the returns gathered in a previous survey in Minneapolis, the relative size of the two cities and the number of solicitors employed, it is safe to say that not less than \$25,000 is collected annually by these schools for instruction by correspondence from the wage earners of Denver.

Not less than \$25,000 a year is being collected by private schools operated for profit other than business colleges. Of this amount, one institution gets \$18,000 for preparing 300 students a year at the rate of \$60 for four months per pupil, to meet the civil service examinations given in the district.

Of the other four schools just mentioned, one is a tailoring college, one gives instructions in telegraph and railroad work, one is a Moler Barber College, and the last, opened in January, gives instruction in practical and commercial art, including cartooning, design, illustration and mechanical drawing.

Three corporations in the city gave instruction to a total of 217 employes in schools operated in each case by the company. The Mountain States Telephone and Telegraph Company, in telephone operation and repair; Daniels and Fisher, in common branches and details of business; and The Denver Gas and Electric Light Company, in the details of that business. No tuition is charged by these corporation schools.

Seventy-five thousand dollars seems a fair estimate of the amount collected by the Y. M. C. A. either in tuition fees or in membership fees of students accepted as part pay for tuition. This school offered instruction in six different lines through day and evening courses, as follows: Commercial and business, social science, industrial and technical, mechanical and building trades, language and academic and poultry raising.

Approximately 4,714 students in all took training in vocational subjects with all these private agencies, of whom 2,000 attended day school, 2,214 evening school, and approximately 500 took correspondence instruction. This does not include the students in three private schools that refused to furnish information. This constitutes a group of students larger than the total registration of all the public high schools in Denver.

In commercial courses a total of 1,212 students were enrolled at the private business colleges and the Y. M. C. A., 1,387 students being reported in evening classes in the same subjects. These courses ranged from the mechanics of office work, such as arithmetic, penmanship, stenography and bookkeeping of the private business colleges and the Y. M. C. A., to more advanced instruction at the Y. M. C. A. in such subjects as salesmanship, business management and principles of accounting. Most of the correspondence school instruction, taken by approximately 500 students in the different schools, was in such vocational subjects as bookkeeping, arithmetic, mechanical and architectural drawing, design and instruction bearing on the different trades. It is impossible to show how these students were distributed among the various subjects.

In all, 217 students took the work with the corporation schools, as has been already stated. Of these, 157 were instructed in telephone operation and repair, and 60 in the details of the business of a department store or the gas and electric company.

The number of schools giving trade education of any kind was six in day and evening classes. These had a total registration in day and evening classes of 680, of whom 597 were enrolled in day classes and 83 in evening classes. The only evening

classes conducted in this work were at the Y. M. C. A. The trade subjects taught in these schools included barbering, ladies' tailoring, telephone construction and repair, machine shop work, automobile repair, operation and construction, drawing and tool making.

The largest vocational school in the city is the Y. M. C. A., and the extent of its work merits a somewhat detailed description of certain courses.

The Y. M. C. A. School of Business Administration and Accountancy conducts a course known as the Pace Standardized Courses in Theory of Accounts, Practical Accounting, Auditing, Business Law, Applied Economics, Organization and Financing. This course aims to prepare students to take the examination for certificates as certified public accountants.

The instructions given in evenings, seventeen weeks of two evenings a week, constitute a semester. Five semesters constitute the full course.

This course is intended for persons with at least a high school education or its equivalent. Students who do not fully meet the preliminary educational requirements are admitted as special students.

During the past year, 109 persons have been enrolled in this course. The tuition is \$72.50 a semester, which included membership in the Y. M. C. A.

A special advisory committee of business men assist the school authorities in making the course thoroughly practical. The Y. M. C. A. also conducts a day automobile school for the training of garage mechanics.

It is stated that the student of average ability will cover the complete course of training in the automobile industry in about six weeks. No time limit is placed upon the courses, however. Frequently a mechanic will complete the course, pass his examination and receive a certificate in four or five weeks' time.

The school has a fairly complete line of machines and a number of engines of different types. The instruction is given by a competent instructor, who is a practical mechanic and gives instruction of a practical nature.

The complete cost of the course to the student is \$45.55, which included membership in the Y. M. C. A., text books, a kit of tools and a deposit on a locker. This rate is on the basis of advanced payment at the time of entrance. Those who wish to defer payment are required to pay \$2.50 extra. Pupils may begin work at any time.

The Association also conducts a machine-shop course, in

which individual instruction is given in the use of engine, lathe, drill press, bench work, the cutting of gears and key-ways on the milling machine and general training in the use of forging. Particular emphasis in this course is put upon the work which a mechanic is expected to do in a garage.

The tuition in this course is \$20 a month, three months for \$55 or \$105 for six months, exclusive of tools and instruments.

When the student has shown a sufficient knowledge of the subject, he may apply for an examination. This examination consists of written and oral work to test the student's theoretical knowledge of the subject of shop practice in handling trouble in engines, in ignition systems, etc., and his ability to handle a car. Upon the satisfactory completion of the work, the student is granted the certificate of the school.

The Association also conducts an evening course in salesmanship. Only those men are eligible who are now engaged in the selling business, or who are closely connected with the selling end of the business house and are over 20 years of age. This course covers fifteen weeks of actual class and demonstration work.

The total cost of this course, where payment is made in advance, is \$27, which includes a complete set of Y. M. C. A. text works and membership in the Association.

A special advisory committee of Denver business men assists the Association in making the work of this course intensely practical.

The fact that such a large number of people are attending private and semi-private schools, and paying annually such a colossal sum of money for instruction in vocational subjects, is indisputable evidence that there is a very great demand for vocational education in Denver and that this demand is not being met by the public schools of the city.

### *Recommendations.*

1. In a widening program of vocational education for Denver many of the courses now offered by private institutions, particularly those charging tuition, will eventually be assumed by the public schools and be given free. There is no more reason why students should be obliged to pay for vocational preparation in one legitimate and desirable line than in another, or for one grade rather than another.

2. The question before the public schools is partly one of resources and partly one of wise choice of the kinds of vocational education now offered at private expense which they shall take



over. It is probable that there will be an increasing number of corporation schools training workers to meet their special needs. The semi-public school not operated for profit is here carefully differentiated from the private school. The semi-public school will continue as long as it serves the public good. The private school operated for profit, which, in many instances, is doing good work, is only a phase of development which will lead to large free public educational opportunities.

3. It may be doubted whether the tuition-charging school, semi-public or a private school operated for profit, will be entirely eliminated by the expansion of free public facilities. There is sufficient evidence to show the existence of a class of ambitious individuals who prefer to pay fees and who do better work under the fee system. These schools will survive or disappear, according to their individual merits, and according to their ability to keep pace or to outrun, from time to time, the public institutions.

## IV.

## A FINAL WORD

In conclusion, the following recommendations of a **general** character are submitted:

1. Denver needs at once to enter, as other cities are **doing**, upon the development of a program for vocational education. While some excellent beginnings have been made, the field is almost a fallow one. With federal aid to vocational education, as seems imminent, a large extension of the work would occur at once. In any event, the city is facing the certainty of a growing expenditure of money in this new and important field. Every consideration requires wise leadership, expert advice, organization and system, as well as carefully directed experimentation with plans and classes. The way to get vocational education in Denver right, is to start right.

2. The very first step that should be taken is the creation of the office of assistant superintendent for vocational education, with a salary sufficient to attract to the position a man with the ability, experience and diplomacy necessary to initiate and develop policies and plans for vocational training in the many different lines in which Denver is interested. He should be treated as an expert by the superintendent over him, so long as he shows himself to be reliable and capable, and he should be given a free hand and large power under the general policies and regulations which the school authorities adopt for his work.

3. All the vocational work of the city, together with the prevocational work, the manual training, domestic science and domestic art and their correlations with other subjects, should be under his general supervision. He should continue the studies of the same and other questions in vocational education, with which this report has been able to deal in only a hasty manner.

4. The school authorities, if they hope to accomplish any satisfactory results in extending vocational work through the public schools, should set aside each year a growing budget for the support and extension of the work. These budgets should be based upon a constructive policy of development.

5. After the selection of an assistant superintendent for vocational education, probably the first step should be the adoption of a policy in regard to the Denver Trade School, including

its location, trades to be taught, and the relation of the school to the trades and trade apprenticeships. The school will never reach its field until a more central location is secured, the entrance requirement modified, and additional trades are added. Close contracts with the trades must be established. Advisory committees must assist the school to make its work practical and place its boys properly as advanced apprentices. The trades must be lead to respect the work of the school and recognize its work by giving its graduates standing as advanced apprentices. Ultimately the school must play a large part in standardizing the requirements for apprenticeship for the trades.

6. The Longfellow School is now idle, but we do not believe it to be a suitable place for the Denver Trade School. The cost of remodeling would be excessive, and the quarters are not satisfactory for the purpose.

7. The building would, however, because of its central location and proximity to the business section, furnish an excellent place to try out all kinds of experimental plans and ventures on a small scale, a resource which every public school system should have. The school might well be known for the present as the "opportunity school," where employed children might attend part time or continuation classes. One of the early efforts might well be the getting of messenger boys from telegraph and other companies, for a portion of their time. So, with boys temporarily unemployed, domestic employes, over-age groups and adult foreigners. It must be remembered that the building will not be fit for use until more window space is provided for all the rooms.

8. One of the early steps which should be taken before the opening of another school year is the establishment of a shorter commercial course in the high schools for those boys and girls who have less than four years to spend in training.

9. Acting with the business and industrial interests of the city, the school authorities should take up the establishment of a four-year course in high school more practical and technical than the present manual training, which will prepare boys for more advantageous entrance to industry on the directive and business side.

10. With the training of pupils for vocations, will come the responsibility for aiding the pupil in choosing training for an occupation and in placing him in the kind of employment for which he has prepared himself. The schools need to begin now to develop the work of vocational guidance and placement,

which should from the start be an integral part of the attendance department.

11. In our opinion no vocational course, whether industrial, technical or commercial, can prepare youth to meet the requirements and opportunities of vocations, without the help of experienced employers and employes from these vocations. They know what is required and are in close touch with changing conditions and demands upon workers. The schools, on the other hand, with this help, should know best how to organize and translate these demands into programs and courses.

Every vocational course taught in the schools should have a carefully selected advisory committee to give advice and suggestion to the school authorities in making the work a success. In our opinion, this should consist, in the case of the trade school courses, of two employers and two employes from each trade, and the principal of the school; and in case of the technical course, of two employers and two employes who are technicians. In the case of the commercial courses this advisory committee should deal with the matter in all high schools. Two employers and two employes who are high-grade accountants should constitute the committee, together with the principal of the high school concerned, or one representative from each commercial department.

12. At the next session of the legislature, a law should be passed which will remove all doubt as to the right of the public schools to carry on public evening classes. The present statutes nowhere mention such schools, and in all the interpretations of the school law by the State Department of Public Instruction, thus far made, public schools supported by public taxation, are defined as schools consisting of kindergarten, the first eight grades, district high schools, union high schools and county high schools. Evening schools are of such recent growth that the state law does not as yet provide for them directly.

At present the support of them out of the public treasury is gained somewhat indirectly by calling these evening schools, elementary night schools and night high schools. As a matter of fact these evening classes are so different in the age, size and condition of their students and the subjects taught, that they resemble but little the kind of public school work contemplated by laws passed years ago before the growth of our widening conception of the service which the public school should render to worker and adult, as well as to immature child. Evening school instruction is of large importance—large enough to be

legalized by direct provision of law rather than by the more or less forced and doubtful interpretation of old statutes.

Perhaps the best illustration of the awkwardness of the present situation as to evening schools in Colorado, is furnished by the case of the adult over 21 years of age. While not expressly stated, the intent of the statutes seems to be that of restricting attendance on the high school to those of school age, this being the period from 6 to 21 years of age. Consequently, the expenditure of school moneys for the instruction of adults in the night high school, is probably illegal at the present time. On the other hand, Section 6009 (R. S., 1908) gives the school board power to admit adults to the elementary school, if that body sees fit to do so. So that it seems legal at the present time to give further training in elementary subjects to adults through an evening school, but not in high school subjects.

13. There is the same need that the law should specifically authorize the use of school moneys for types of schools and kinds of training which the public schools, responding to the demand, are already beginning to develop, without any other than indirect legislative sanction. At least twenty of the states have not only done this, but have provided some form of special state aid for one or more of the following: Industrial, agricultural and household arts, and in some cases commercial education. While more than thirty of the states have in their statutes recognized and authorized the use of school funds for practical work of one kind or another, it would seem sufficient here to recommend that the next session of the legislature be asked to enact a carefully written statute, which shall at least authorize in direct language the establishment of evening schools of all grades, wherein the adult as well as the youth may be taught instruction in agricultural, industrial, household arts, and commercial subjects for minors and adults, through all-day, part-time, continuation and evening school classes.

14. The interest and good will which practically every person connected in any way with the Denver schools has shown toward this study, and the cordial support which the business and industrial interests, including both employers and employes have given to the various proposals, is prophetic of helpful and successful cooperation in putting into effect a program of vocational education for the city of Denver.

APPENDICES

- A. Tables showing distribution of workers in all occupations in Denver.
- B. Forms used by the Attendance, Permits and Placement Department of the Minneapolis Public Schools.  
(Forms filed with Board of Education and not reproduced here.)
- C. Tables showing cost of equipment, materials and Instruction—Denver Trade School, 1914-15.

APPENDIX A

1. MANUFACTURING AND MECHANICAL INDUSTRIES—All Trades and Industries.

All Trades and Industries—	Skilled		Semi-Skilled		Laborer	
	Male	Female	Male	Female	Male	Female
Building Trades .....	7,372	11	..	..	3,591	35
Metal Industries .....	3,321	2	827	16	885	4
Tobacco Industry .....	..	..	278	77	1	..
Clothing Industry .....	590	3,047	67	87	1	3
Liquor and Beverage.....	..	..	158	..	40	1
Supervisors and Technicians .....	3,647	85	..	..	..	..
Chemical Industries .....	187	1	27	27	231	1
Lumber and Furniture....	364	..	273	10	30	..
Jewelry .....	177	1	21	16	..	..
Food Industries .....	448	36	252	256	264	17
Clay, Glass and Stone....	205	..	209	..	435	..
Textile Industries .....	..	..	62	46	12	1
Leather, Boots and Shoes.	279	..	150	17	5	3
Painting and Engraving...	966	44	147	155	10	..
All Other Industries.....	472	12	448	162	5,892	39
Total .....	18,028	3,239	2,919	869	11,397	104

2. MANUFACTURING AND MECHANICAL INDUSTRIES—Building Trades. DENVER

Building Trades—	Skilled		Semi-Skilled		Laborer	
	Male	Female	Male	Female	Male	Female
Builders and Building Contractors .....	1,404	7	..	..	..	..
Brick and Stone Masons..	705	..	..	..	..	..
Plumbers, Gas and Steam Fitters .....	845	..	..	..	..	..
Roofers and Slaters.....	44	..	..	..	..	..
Plasterers .....	221	..	..	..	..	..
Paper Hangers .....	172	..	..	..	..	..
Apprentices .....	186	..	..	..	..	..
Carpenters .....	2,868	2	..	..	..	..
Painters .....	927	2	..	..	..	..
Not otherwise specified...	..	..	..	..	3,591	35
Total .....	7,372	11	..	..	3,591	35



## 3. MANUFACTURING AND MECHANICAL INDUSTRIES—Metal Industries.

## DENVER

Metal Industries—	Skilled		Semi-Skilled		Laborer	
	Male	Female	Male	Female	Male	Female
Moulders, Folinders, Cast- ers . . . . .	203	..	..	..	..	..
Tinsmiths . . . . .	254	..	..	..	..	..
Boilermakers . . . . .	242	..	..	..	..	..
Fillers, Grinders, Buffers.	25	1	..	..	..	..
Mechanics . . . . .	122	1	..	..	..	..
Oilers of Machinery.....	12	..	..	..	..	..
Blacksmiths . . . . .	632	..	..	..	..	..
Machinists, Millwrights ..	1,727	..	..	..	..	..
Blast Furnaces, Rolling Mills . . . . .	50	..	86	..	36	..
Structural Iron Work.....	54	..	..	..	..	..
Copper and Brass Fac- tories . . . . .	..	..	16	1	15	..
Automobile Factories ....	..	..	20	2	2	..
Car and Railroad Shops..	..	..	315	4	72	..
Lead and Zinc Factories..	..	..	9	..	378	1
Tinware and Enamel Ware	..	..	14	..	9	..
All other works.....	..	..	367	9	373	3
Total . . . . .	3,321	2	827	16	885	4

## 4. MANUFACTURING AND MECHANICAL INDUSTRIES—Clothing.

## DENVER

Clothing Industry—	Skilled		Semi-Skilled		Laborer	
	Male	Female	Male	Female	Male	Female
Dressmakers, Seamstresses	1	1,961	..	..	..	..
Dyers . . . . .	7	3	..	..	..	..
Milliners . . . . .	28	626	..	..	..	..
Sewers, Sewing Machine Operators . . . . .	18	262	..	..	..	..
Tailors and Tailoresses...	536	142	..	..	..	..
Apprentices . . . . .	..	53	..	..	..	..
Hat Factories . . . . .	..	..	13	1	..	..
Suit, Cloak, Overall Fac- tory . . . . .	..	..	38	46	..	..
Other Clothing Factories.	..	..	16	39	1	3
Total . . . . .	590	3,047	67	87	1	3

Liquor and Beverage—	Skilled		Semi-Skilled		Laborer	
	Male	Female	Male	Female	Male	Female
Breweries . . . . .	..	..	115	..	40	1
Distilleries . . . . .	..	..	9	..	..	..
All Other Beverages.....	..	..	34	..	..	..
Total . . . . .	..	..	158	..	40	1

## 5. MANUFACTURING AND MECHANICAL INDUSTRIES—Supervisors and Technicians.

## DENVER

Supervisors, Techni- cians—	Skilled		Semi-Skilled		Laborer	
	Male	Female	Male	Female	Male	Female
Engineers, Stationery ....	897	1	..	..	..	..
Manufacturers, Officials ..	1,035	47	..	..	..	..
Electrical Engineers ....	765	..	..	..	..	..
Foremen and Overseers..	241	34	..	..	..	..

**5. MANUFACTURING AND MECHANICAL INDUSTRIES—Supervisors and Technicians—Continued.**

Supervisors, Technicians—	Skilled		Semi-Skilled		Laborer	
	Male	Female	Male	Female	Male	Female
Firemen, except Locomotive Department . . . . .	274	..	..	..	..	..
Engineers, Mechanical ...	98	..	..	..	..	..
Managers, Superintendents	337	3	..	..	..	..
<b>Total . . . . .</b>	<b>3,647</b>	<b>85</b>	<b>..</b>	<b>..</b>	<b>..</b>	<b>..</b>

Chemical Industries—	Skilled		Semi-Skilled		Laborer	
	Male	Female	Male	Female	Male	Female
Painter, Glazier, Varnisher (factory) . . . . .	187	1	..	..	..	..
Paint Factories . . . . .	..	..	14	13	2	..
Gas Works . . . . .	..	..	..	..	175	..
Oil Refineries . . . . .	..	..	..	..	3	..
Other Chemical Factories.	..	..	13	14	51	1
<b>Total . . . . .</b>	<b>187</b>	<b>1</b>	<b>27</b>	<b>27</b>	<b>231</b>	<b>1</b>

**6. MANUFACTURING AND MECHANICAL INDUSTRIES—Lumber and Furniture.**

**DENVER**

Lumber and Furniture—	Skilled		Semi-Skilled		Laborer	
	Male	Female	Male	Female	Male	Female
Upholsterers. . . . .	83	..	95	6	22	..
Sawyers . . . . .	10	..	..	..	..	..
Cabinet Makers . . . . .	228	..	..	1	..	..
Furniture and Piano Factory . . . . .	..	..	58	1	4	..
Coopers . . . . .	33	..	..	..	..	..
Wood Carvers . . . . .	10	..	..	..	..	..
Wagon and Carriage Factory . . . . .	..	..	52	1	2	..
Other Woodworking Factories . . . . .	..	..	68	1	2	..
<b>Total . . . . .</b>	<b>364</b>	<b>..</b>	<b>273</b>	<b>10</b>	<b>30</b>	<b>..</b>

Jewelry—	Skilled		Semi-Skilled		Laborer	
	Male	Female	Male	Female	Male	Female
Goldsmith and Silverware.	10	..	..	..	..	..
Jeweler and Watchmaker.	140	1	..	..	..	..
Clock and Watch Factories	..	..	3	..	..	..
Jewelry Factories . . . . .	27	..	18	16	..	..
<b>Total . . . . .</b>	<b>177</b>	<b>1</b>	<b>21</b>	<b>16</b>	<b>..</b>	<b>..</b>

**7. MANUFACTURING AND MECHANICAL INDUSTRIES—Food.**

**DENVER**

Food Industries—	Skilled		Semi-Skilled		Laborer	
	Male	Female	Male	Female	Male	Female
Bakers . . . . .	390	36	23	87	21	8
Butter and Cheese . . . . .	..	..	37	16	17	1
Flour and Grain Mills . . . . .	45	..	10	1	31	..
Fruit and Vegetables . . . . .	..	..	7	15	4	5
Slaughtering and Packing	13	..	47	10	169	..
Sugar and Candy Factories	..	..	92	120	3	..
Other Food Factories . . . . .	..	..	36	7	19	3
<b>Total . . . . .</b>	<b>448</b>	<b>36</b>	<b>252</b>	<b>256</b>	<b>264</b>	<b>17</b>

## 7. MANUFACTURING AND MECHANICAL INDUSTRIES—Food—Continued.

	Skilled		Semi-Skilled		Laborer	
Clay, Glass and Stone—	Male	Female	Male	Female	Male	Female
Glass Blowers .....	18	..	43	..	8	..
Brick, Tile and Terra Cotta .....	..	..	104	..	357	..
Lime, Cement and Gypsum	..	..	24	..	30	..
Marble and Stone.....	187	..	12	..	21	..
Potteries .....	..	..	26	..	19	..
Total .....	205	..	209	..	435	..

## 8. MANUFACTURING AND MECHANICAL INDUSTRIES—Textiles.

## DENVER

	Skilled		Semi-Skilled		Laborer	
Textile Industries—	Male	Female	Male	Female	Male	Female
Loom Fixers .....	..	..	..	..	..	..
Beamers and Warpers....	..	..	..	..	..	..
Carders, Combers, Lappers	..	..	..	..	..	..
Spinners .....	..	..	..	..	..	..
Weavers .....	..	..	32	10	..	..
Winders, Reelers, Spool- ers .....	..	..	..	..	..	..
Not otherwise specified...	..	..	30	36	12	1
Total .....	..	..	62	46	12	1

## 9. MANUFACTURING AND MECHANICAL INDUSTRIES—Leather.

## DENVER

	Skilled		Semi-Skilled		Laborer	
Leather, Boots and Shoes—	Male	Female	Male	Female	Male	Female
Shoemakers and Cobblers	279	..	..	..	..	..
Shoe Factories .....	..	..	40	17	1	3
Tanneries .....	..	..	15	..	4	..
Harness and Saddle.....	..	..	95	..	..	..
Total .....	279	..	150	17	5	3

	Skilled		Semi-Skilled		Laborer	
Printing and Engrav- ing—	Male	Female	Male	Female	Male	Female
Engravers .....	107	5	..	..	..	..
Pressmen .....	146	..	..	..	..	..
Compositors, Typesetters.	627	37	..	..	..	..
Electrotypers, Lithograph- ers .....	86	2	..	..	..	..
Printing .....	..	..	147	155	10	..
Total .....	966	44	147	155	10	..

## 10. MANUFACTURING AND MECHANICAL INDUSTRIES—All Other Industries.

## DENVER

	Skilled		Semi-Skilled		Laborer	
All Other Industries—	Male	Female	Male	Female	Male	Female
Piano and Organ Tuners..	47	1	..	..	..	..
Pattern and Model Makers	74	..	..	..	..	..
Apprentices .....	350	11	..	..	..	..
Electric Power Plants....	..	..	..	..	16	..
Electric Supply Factories.	..	..	16	8	11	..
Paper and Pulp.....	..	..	11	3	2	..
Rubber Factories .....	..	..	10	..	1	..
Paper Box Factories.....	..	..	3	10	..	..
Not otherwise specified...	1	..	408	141	5,862	39
Total .....	472	12	448	162	5,892	39

**11. TRADE AND COMMERCE—Trade.**  
**DENVER**

Trade—	Skilled		Laborer	
	Male	Female	Male	Female
Bankers and Bank Officials.....	132	4	..	..
Commercial Brokers .....	219	1	..	..
Loan Brokers .....	13	2	..	..
Pawn Brokers .....	3	..	..	..
Stock Brokers .....	204	1	..	..
Brokers and Promoters.....	158	2	..	..
Clerks in Stores.....	1,583	777	..	..
Commercial Travelers .....	1,104	14	..	..
Decorators, Dressers and Drapers.....	64	6	..	..
Deliverymen .....	..	..	1,054	..
Floorwalkers and Overseers.....	150	18	..	..
Inspectors, Gaugers, Samplers.....	34	12	..	..
Insurance Agents and Officials.....	496	13	..	..
Coal, Lumber Yards, Warehouse.....	..	..	349	..
Store Employes .....	..	..	323	13
Newsboys .....	..	..	182	1
Employment Office Keepers.....	29	1	..	..
Elevator and Warehouse Proprietors.....	40	..	..	..
Other Proprietors and Officials.....	96	1	..	..
Real Estate Agents and Officials.....	1,354	49	..	..
Retail Dealers .....	4,446	311	..	..
Demonstrators, Auctioneers .....	24	50	..	..
Sales Agents .....	134	17	..	..
Salesmen and Saleswomen.....	3,439	1,065	..	..
Undertakers .....	80	6	..	..
Wholesale Dealers, Importers.....	295	11	..	..
Fruit Graders and Packers.....	6	..	..	..
Meat Cutters .....	152	..	..	..
Not Otherwise Specified.....	95	22	..	..

**12. DOMESTIC AND PERSONAL SERVICE.**  
**DENVER**

Service—	Skilled		Semi-Skilled		Laborer	
	Male	Female	Male	Female	Male	Female
Barbers and Manicurists..	677	272	..	..	..	..
Bartenders .....	469	2	..	..	..	..
Billiard Hall, Dance Hall.	51	..	..	..	..	..
Boarding and Lodging						
Keepers .....	163	1,298	..	..	..	..
Bootblacks .....	..	..	56	..	..	..
Charwomen and Cleaners.	..	..	..	..	35	47
Elevator Tenders .....	..	..	158	..	..	..
Hotel Keepers and Man-						
agers .....	192	107	..	..	..	..
Housekeepers & Stewards	45	541	..	..	..	..
Janitors and Sextons.....	534	43	..	..	..	..
Laborers .....	..	..	..	..	127	12
Launderers, not in Laundry	..	..	25	774	..	..
Laundry Operatives .....	..	..	221	613	..	..
Laundry Owners and Man-						
agers .....	88	7	..	..	..	..
Midwives and Nurses, not						
Trained .....	..	..	22	575	..	..
Porters .....	..	..	577	..	..	..
Restaurant, Cafe, Lunch-						
room .....	240	76	..	..	..	..
Saloon Keepers .....	289	1	..	..	..	..
Bell Boys and Chore Boys.	..	..	68	2	..	..
Chambermaids .....	..	..	..	245	..	..
Coachmen and Footmen...	..	..	36	..	..	..

## 12. DOMESTIC AND PERSONAL SERVICE—Continued.

Service—	Skilled		Semi-Skilled		Laborer	
	Male	Female	Male	Female	Male	Female
Cooks .....	820	578	..	..	..	..
Waiters .....	651	591	..	..	..	..
Bathhouse Keepers .....	19	4	..	..	..	..
Cemetery Keepers .....	6	..	..	..	..	..
Cleaners and Renovators..	66	23	..	..	..	..
Umbrella Menders and Scissors Grinders .....	..	..	3	..	..	..
Others not Specified.....	5	1	343	3,005	..	..

## 13. TRANSPORTATION—Summary.

Transportation—	DENVER		Skilled		Laborer	
	Male	Female	Male	Female	Male	Female
Water .....	2	..	7	..	..	..
Road and Street.....	2,723	3	..	..	..	..
Railway .....	5,486	17	1,370	16	..	..
Express, Post, Telegraph, Phone.....	1,141	554	..	..	..	..
All Other Pursuits.....	1,688	42	870	..	..	..

## 14. TRANSPORTATION—Water, Road and Street.

Water Transportation—	Skilled	
	Male	Female
Boatmen, Canalmen and Lockkeepers, Captains, Masters, Mates and Pilots.....	2	..
Longshoremen and Stevedores, Sailors and Deck Hands..	7	..
Road and Street Transportation—	Skilled	
	Male	Female
Carriage and Hack Drivers.....	59	..
Chauffers .....	215	..
Draymen, Teamsters and Expressmen.....	2,070	1
Foremen of Livery and Transfer Company.....	39	..
Garage Keepers and Managers.....	48	..
Hostlers and Stable Hands.....	167	..
Livery Stable Keepers and Managers.....	64	..
Proprietors and Managers of Transfer Company.....	61	2

## 15. TRANSPORTATION—Railway.

Railway Transportation—	DENVER		Skilled		Laborer	
	Male	Female	Male	Female	Male	Female
Baggagemen .....	44	..	..	..	..	..
Freight Agents .....	35	..	..	..	..	..
Boiler Washers and Engine Hostlers.....	42	..	..	..	..	..
Brakemen .....	355	..	..	..	..	..
Conductors .....	853	..	..	..	..	..
Foremen and Overseers.....	158	..	..	..	..	..
Locomotive Engineers .....	569	..	..	..	..	..
Locomotive Firemen .....	463	..	..	..	..	..
Motormen .....	356	..	..	..	..	..
Officials and Superintendents.....	167	..	..	..	..	..
Switchmen, Flagmen and Yardmen.....	395	..	..	..	..	..
Ticket and Station Agents.....	38	1	..	..	..	..
Laborers .....	..	..	1,370	16	..	..

## 16. TRANSPORTATION—Express, Post, Etc.

Express, Post, Telegraph, Telephone—	DENVER		Skilled		Laborer	
	Male	Female	Male	Female	Male	Female
Express Company Agents.....	24	..	..	..	..	..
Express Company Messengers.....	89	..	..	..	..	..
Mail Clerks—Railway .....	98	..	..	..	..	..
Mail Carriers .....	208	2	..	..	..	..
Telegraph and Telephone Linemen.....	138	..	..	..	..	..
Telegraph and Telephone Messengers.....	80	1	..	..	..	..

## 16. TRANSPORTATION—Express, Post, etc.—Continued.

	Skilled		Laborer	
	Male	Female	Male	Female
All Other Transportation Pursuits—				
Telegraph and Telephone Operators.....	317	551	..	..
Foremen and Overseers—Road, Street....	23	..	..	..
Foremen—Telephone, Telegraph .....	16	7	..	..
Foremen, not Otherwise Specified.....	2	..	..	..
Inspectors .....	195	2	..	..
Proprietors, Officials, Managers.....	35	10	..	..
Laborers . . . . .	138	2	870	..

## 17. CLERICAL OCCUPATIONS.

## DENVER

Occupations—	Skilled	
	Male	Female
Agents .....	304	23
Canvassers .....	75	22
Collectors .....	224	9
Bookkeepers, Cashiers, Accountants.....	1,814	1,002
Shipping Clerks .....	305	3
Bundle and Cash Boys and Girls.....	33	121
Messenger, Errand and Office Boys.....	420	25
Stenographers and Typewriters.....	422	1,822
Other Clerks, not Specified.....	2,688	604

## 18. PROFESSIONAL SERVICE.

## DENVER

Profession—	Skilled	
	Male	Female
Actors .....	94	74
Architects .....	113	4
Artists, Sculptors and Art Teachers.....	121	180
Authors .....	25	21
Editors and Reporters.....	196	35
Chemists, Assayers and Metallurgists.....	150	6
Civil Engineers and Surveyors.....	489	..
Mining Engineers .....	284	..
Clergymen .....	296	2
College Presidents and Professors.....	48	26
Dentists .....	207	12
Designers .....	20	9
Draughtsmen .....	151	11
Inventors .....	31	..
Lawyers, Judges and Justices.....	796	8
Musicians and Music Teachers.....	369	530
Photographers . . . . .	136	58
Physicians and Surgeons.....	724	113
Showmen .....	77	..
Teachers—Athletics and Dancing.....	22	12
Teachers—School .....	210	1,446
Trained Nurses .....	25	502
Veterinary Surgeons .....	29	..
Abstractors, Notaries, Justice of Peace.....	18	2
Hypnotists and Spiritualists.....	3	10
Healers .....	22	79
Keepers of Charitable and Penal Institutions.....	17	11
Officials of Lodges and Societies.....	57	9
Religious and Charity Workers.....	47	56
Theatrical Owners, Managers, Officials.....	54	2
Others not Classified.....	83	34



## 19. PUBLIC SERVICE—Not Elsewhere Specified.

## DENVER

Office—	Skilled		Laborer	
	Male	Female	Male	Female
Firemen .....	174	..	..	..
Guards, Watchmen, Doorkeepers.....	218	1	..	..
Garbagemen and Scavengers.....	12	..	..	..
Detectives . . . . .	57	..	11	..
Marshals and Constables.....	17	..	..	..
Probation and Truant Officers.....	..	1	..	..
Sheriffs .....	17	..	..	..
Officials and Inspectors, City.....	130	11	..	..
Officials and Inspectors, County.....	20	10	..	..
Officials and Inspectors, State.....	35	9	..	..
Officials and Inspectors, U. S.....	95	4	..	..
Policemen .....	222	..	..	..
Soldiers, Sailors, Marines.....	54	..	..	..
Others not Specified.....	45	2	189	..

## 20. AGRICULTURE, FORESTRY AND ANIMAL HUSBANDRY—Summary.

## DENVER

Industries—	Skilled		Laborer	
	Male	Female	Male	Female
Farm .....	394	25	428	16
Garden, Florist, Fruit, Nursery.....	289	13	323	16
Fish and Oyster .....	11	..	..	..
Forestry . . . . .	19	..	..	..
Lumber .....	16	..	..	..
Stock .....	135	..	..	..
All Other Agricultural and Animal Husbandry .....	143	11	..	..

21. AGRICULTURE, FORESTRY AND ANIMAL HUSBANDRY—  
Farm, Garden, Etc.

## DENVER

Farm Industry—	Skilled		Laborer	
	Male	Female	Male	Female
Dairy Farm .....	76	5	75	8
Dairy Farm Foremen.....	2	..	..	..
Farm .....	227	8	443	21
Farm Foremen .....	5	1	..	..

Garden, Florist, Fruit, Nursery—	Skilled		Laborer	
	Male	Female	Male	Female
Florists . . . . .	50	7	123	7
Fruit Growers .....	30	1	29	1
Gardeners .....	131	5	171	8
Landscape Gardeners .....	73	..	..	..
Garden and Greenhouses.....	..	..	..	..
Orchard and Nursery.....	..	..	..	..

## 22. AGRICULTURE, FORESTRY AND ANIMAL INDUSTRY.

## DENVER

Fish and Oysters—	Skilled		Laborer	
	Male	Female	Male	Female
Fishermen and Oystermen.....	11	..	..	..

Forestry—	Skilled		Laborer	
	Male	Female	Male	Female
Foresters .....	19	..	..	..

**22. AGRICULTURE, FORESTRY AND ANIMAL INDUSTRY—Continued.**

Lumber—	Skilled		Laborer	
	Male	Female	Male	Female
Foremen and Overseers.....	..	..	..	..
Lumbermen and Raftsmen.....	12	..	..	..
Teamsters and Haulers.....	..	..	..	..
Woodchoppers, Tie Cutters.....	3	..	..	..
Owners and Managers.....	1	..	..	..

**23. AGRICULTURE, FORESTRY AND ANIMAL HUSBANDRY.****DENVER**

Stock Industry—	Skilled		Laborer	
	Male	Female	Male	Female
Stock Herders, Drovers, Feeders.....	64	..	..	..
Stock Raisers .....	113	..	..	..

All Other Agricultural and Animal Husbandry Industries—	Skilled		Laborer	
	Male	Female	Male	Female
Apiarists .....	5	1	..	..
Corn Shellers, Hay Balers, Ditchers.....	62	..	..	..
Poultry Raisers and Laborers.....	21	8	..	..
Others not Specified.....	55	2	..	..

**24. MINING INDUSTRY.****DENVER**

Operators and Operatives—	Skilled		Laborer	
	Male	Female	Male	Female
Foremen, Overseers, Inspectors.....	16	..	..	..
Managers .....	89	..	..	..
Officials .....	21	1	..	..
Operators .....	296	2	..	..
Coal Mine .....	..	..	200	..
Copper Mine .....	..	..	7	..
Gold and Silver Mine.....	..	..	362	..
Iron Mine .....	..	..	4	..
Stone Quarry .....	..	..	25	..
Oil and Gas Well.....	..	..	6	2
Others not Specified.....	..	..	297	..

**APPENDIX C****COST FIGURES, DENVER SCHOOL OF TRADES.****1. Equipment Costs.**

June 30, 1915.

Carpenter Shop .....	\$3,041.87
Plumbing Shop .....	590.69
Printing Shop .....	3,608.76

**Costs of Materials.**

1914-1915.

Carpenter Shop—		
Materials used .....	\$413.29	
Materials sold to students.....	34.35	
		378.94
Average daily attendance.....	13 students	
Daily time in shop, 6 per. for 183 days..	1,098 periods	
10 periods for 38 days.....	380 periods	
Length of period.....	40 minutes	
Year contained .....	12,809 stu. hrs.	
Value of product manufactured for city schools.....		933.76

Plumbing Shop—

Materials used .....	132.60
Average daily attendance.....	11 students
Daily time in shop, 6 per. for 183 days..	1,098 periods
10 periods for 38 days.....	380 periods
Length of period.....	40 minutes
Year contained .....	10,839 stu. hrs.
Value of product manufactured for city schools.....	38.30

Printing Shop—

Materials used .....	\$2,087.44
Materials sold to students.....	4.25
	<hr/>
	2,083.19
Average daily attendance.....	9 students
Daily time in shop, 8 per. for 183 days..	1,464 periods
10 periods for 38 days.....	380 periods
Length of period.....	40 minutes
Year contained .....	11,061 stu. hrs.
Value of product manufactured for city schools.....	3,136.39

2. Cost of Instruction at the Denver Trades School.

1914-1915.

	Total Operating Expense.	Number Enrolled.	Cost per Pupil.	Average Number Belonging.	Cost per Pupil.	Average Daily Attendance.	Cost per Pupil.
Regular term .....	\$3,871.77	41	\$94.43	33	\$117.32	30	\$129.05
Summer term .....	713.46	41	17.40	33	21.62	30	23.78
Credits for work done, al- lowed against operat- ing expense .....	1,383.25						
Total .....	<hr/> \$5,968.48						

Comparative Statement of Pay Roll Cost Per Pupil in High School.

Regular term .....	\$3,767.57	41	\$91.89	33	\$114.17	30	\$125.58
Summer term .....	694.26	41	16.93	33	21.04	30	23.14
Credits for work done, al- lowed against operat- ing expense .....	1,383.25						
Total .....	<hr/> \$5,845.08						





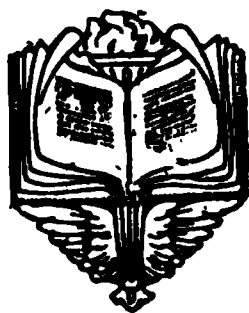




**REPORT OF THE**  
**SCHOOL SURVEY**  
of

**School District Number One**  
In the City and County of  
**Denver**

**Part IV**  
**THE BUSINESS MANAGEMENT**  
By J. T. BYRNE



**The School Survey Committee**  
Denver, Colorado  
1916



# REPORT OF THE SURVEY

---

The report of the survey of the Denver situation is presented in five sections:

**Part I. General Organization and Management.**

By Franklin Bobbitt. 25c.

Supplementary Report.

By Ellwood P. Cubberley. 15c.

**Part II. The Work of the Schools. 25c.**

Elementary Schools.

By Franklin Bobbitt.

High Schools.

By Charles H. Judd.

**Part III. The Industrial Survey.**

By C. A. Prosser. 25c.

**Part IV. The Business Management (Preliminary).**

By F. S. Staley and J. T. Byrne. 15c.

The Business Management (Final).

By J. T. Byrne. 25c.

**Part V. The Building Situation and Medical Inspection.**

By Lewis M. Terman. 15c.

Copies of these reports may be had postpaid at the price named upon application to The School Survey Committee, 606 Chamber of Commerce Building, Denver, Colorado.

CARLOS M. COLE,  
R. E. WRIGHT,  
Survey Committee.

## Contents

	Page
Foreword .....	5
Summary of Suggested Changes.....	7
Buildings and Grounds Department—	
1. Organization .....	14
2. Maintenance and Improvement of Buildings, Grounds and Equipment.....	15
(a) Planning Work Program.....	15
(b) Performing the Work.....	19
(c) Recording the Work.....	23
Requisitions and Work Orders.....	23
Workmen's Time Cards and Reports.....	24
Payrolls .....	24
Material Cost.....	26
3. Operation of Plant.....	27
Inspection Service.....	27
Janitors' and Engineers' Salary Schedule.....	29
Coal Consumption.....	32
Analysis and Test of Coal.....	35
General Supplies.....	38
Janitors' Reports.....	41
Purchase of Supplies and Equipment—	
1. Organization .....	42
2. Methods and Procedure.....	45
Annual Estimates—Educational and General Supplies.	45
Bid or Specification Sheets and Awarding of Bids.....	45
Specifications for Educational and General Supplies...	48
Inspection Service.....	50
Purchase Orders.....	52
Requisitions on the Storehouse.....	53
Records and Files (Educational and General Supplies) .	55
Repair Material and Supplies.....	55

66-12-1-3-1-19 g.

	Page
Storage and Distribution of Supplies—	
1. Organization .....	58
2. Methods and Procedure.....	58
Receiving Supplies—Educational and General.....	58
Issuing Supplies.....	59
Stores Ledger and Reports of Goods Received and Issued .....	61
Inventory of Supplies in Storehouse.....	64
Second-hand Supplies.....	64
Storage Facilities.....	65
Miscellaneous Repair Material—General Storehouse....	65
Manual Training Department Supplies.....	66
Sewing Department Supplies.....	67
Delivery Service.....	67
Suggested Changes in Storing and Distributing Supplies	70

#### Accounting and Auditing—

1. Organization .....	72
2. Methods and Procedure.....	73
The Budget.....	73
General Ledger Accounts.....	77
General and Special Fund Accounts.....	78
Stores Account.....	82
Departmental Cost.....	82
School Property Returned to Storehouse.....	83
Supplies and Equipment—Classification.....	84
Repairs and Improvements—Classification.....	85
Depreciation .....	86
Voucher Register and Register of Distribution of Ex- penditures .....	88
Miscellaneous Cash Collections.....	91
Inventories of Supplies and Equipment.....	92
Invoices and Discounts.....	93
Vouchers and Voucher Checks.....	99
Payrolls .....	99

#### General—

Construction of New Buildings.....	102
Insurance on Buildings and Equipment.....	104
Service Records.....	105
Supervisors as Clerks, Purchasing Agents, etc.....	106
Administrative Offices.....	107

## Foreword

---

It is an incident worthy of more than passing notice, that of several experts consulted or brought to Denver in connection with the present school survey, to study different phases of public school activity in this city, each in his individual capacity arrived at practically the same conclusion with respect to the fundamental weaknesses in the public school system of Denver as administered up to the present year.

These conclusions, reached in different ways and from different perspectives by men competent to judge, being so unanimous hardly need further confirmation, yet as cumulative evidence and as indicating in part the "cause" for many of the conditions criticised in the previous reports on the survey, the present report on The Business Management should be of interest and value in any plan of reorganization following the survey.

The evidence points clearly to a lack of a centralized directing power, guiding all business matters and procedure in accordance with a clearly defined business policy and program of action. There is duplication of functions and of duties and responsibilities. Each department, division or other organization unit appears to be working along lines for the attainment of its own particular ends, so far as the business procedure is concerned, without any especial concern as to what the other organization groups may be doing along similar lines. No employee seems to know definitely what any department, division, etc., outside of his own office, is doing, or what records are kept or methods followed in the handling of business transactions in different departments, etc.

There can be no conclusion but that these conditions exist largely owing to committee control of different functions and activities without any co-ordinating responsibility. The methods and purpose of committees, each in its own sphere of activity, may have been directed with the best intentions and at the sacrifice of much personal attention of members of the committees, yet the immediate and final result has been to split the organization into small separate groups without cohesion, each working along independent lines. The committee form of control and direction of details, as operated in the past, has tended toward decentralization rather than centralization of functions and activities.

There is no reason why the business affairs of the Board of Education cannot be managed and operated just as efficiently

as if they were managed and operated under private interests. The same tests of efficiency should be applied to the Board's activities as are applied in well-managed private undertakings, operated for profit. To realize the benefits of private management, the Board of Education must adopt the same principles, standards and organization control, with a single responsible head, that make possible the success of private undertakings.

Attention is here called to the fact that the accompanying report is not the result of an audit or examination of the books, documents and accounts of the Board of Education—the accuracy of the accounts was not brought into question in the survey. The system of doing business, the methods and procedure and the organization established for carrying on the business affairs, these were the things subject to scrutiny in the progress of the study.

It should be remembered, also, in this connection, that, while the report covers, somewhat in detail, many points of the business activities, it could not possibly cover in full particular every phase of the subject owing to lack of time and the desire to confine the study largely to the major business problems of the Board. In this way, it was believed, attention would not be distracted by lesser matters from the important parts of the report.

Further, there is no desire in anything contained in this report to reflect in any manner on any person now or previously employed in the Board of Education. Rather it is desired to emphasize here the unfailing courtesy and kindness in assisting in the collection of the data for the report, of the officers and other employees. Within the limited scope of their function and powers the employees of the School Board have in the past made certain changes and suggested others, designed to improve the business affairs of the district.



# **Summary of Suggested Changes in Business Organization and Methods**

---

## **BUILDINGS AND GROUNDS DEPARTMENT**

### **Maintenance and Improvement**

- a. There should be an annual survey of each school in the district to determine the repairs or improvements needed or desirable in each building, the result of the survey to be submitted to the Board of Education in classified form, with estimated costs, and be the basis for the adoption of a budget and program of work in the buildings and grounds department for a fiscal year.
- b. The amount allotted each school for repairs and improvements should be set up in a ledger. The estimated cost of each work order for a school should be charged as an encumbrance to the respective budget accounts and liquidated by reports of actual cost of work done.
- c. The supervising engineer should report monthly to, or whenever requested by, the superintendent of schools, showing the progress of repair and improvement work, the status of each job, and the relation to the work program of all work completed or under way.
- d. The buildings and grounds department should be fully equipped with all necessary plans, drawings and other records required in the work of the department.
- e. The department should adopt a policy which shall maintain a fairly constant force of mechanics and laborers on permanent employment, instead of a fluctuating, temporary force, high in one month and low in the next.
- f. The supervising engineer's offices should be located in the same building with the repair shops and general storehouse.
- g. An automobile should be provided for the supervising engineer to facilitate visits to school buildings in connection with the work of the department.
- h. Motorcycles should be provided those foremen who have to supervise the work of different gangs of mechanics in dif-

- ferent schools, and to facilitate an emergency crew getting to a building without unnecessary delay.
- i. Workmen's time cards should be turned in each day to the cost clerk and should show all particulars relating to job numbers, names of schools in which work was done, hours worked on each job, etc.
  - j. The statements "Foremen's Time Sheet" and "Time Sheet" should be discontinued. A payroll sheet, designed for the purpose, should be kept by the cost clerk and entered up each day from the daily time cards. No distribution of labor cost, as between jobs or school buildings, should appear on the payrolls.
  - k. All material used in buildings and grounds department should be obtained on requisition from the general storekeeper, and all supplies used in a job should be charged to that job.
  - l. There should be established at once a system of job cost cards, or job ledgers, arranged in accordance with a comprehensive system of classification of work performed, which will make available any desired information on the work of the department without the need of a costly analysis of the records.

### **Operation of Plant**

- a. A qualified inspector or engineer should be appointed or designated to have supervision and direction of all janitorial work in the schools. He should be competent to instruct janitors in the efficient use of all mechanical equipment in school buildings.
- b. A detailed study should be made of the conditions surrounding the work of cleaning and caring for each school building with the object of revising the janitors' and engineers' salary schedule on a basis of floor area, area of walks and grounds, area of glass, and the relation of heating and ventilating to floor area.
- c. A system of grading and advancing janitors and engineers should be established in connection with a revised schedule of salaries.
- d. A thorough study should be made of the heating and ventilating equipment in school buildings to determine the most economical coal to be used and wherein the operation of the plants may be improved.
- e. All coal delivered to schools should be inspected. The plan, suggested by the supervising engineer, of having a central

coal yard under the control of the Board of Education, should be investigated. It is worthy of consideration and study.

- f. Definite standards should be established to regulate the quantity and kinds of supplies, etc., that janitors may use in their work of cleaning and caring for buildings. These standards should be a basis for the issue of janitors' supplies from the general storehouse.
- g. Janitors should be required to report monthly on (a) the coal consumption in their respective schools; (b) readings of gas and electric light meters; (c) repairs made by janitors, and (d) the operation of the heating and ventilating appliances.

### **PURCHASE OF SUPPLIES AND EQUIPMENT**

- a. There should be only one purchasing department and only one purchasing officer.
- b. All supply estimates for a succeeding school year's needs should be in the central purchasing department by not later than February first of each year.
- c. A definite procedure should be established with respect to all transactions involved in the purchase of supplies to maintain proper working relations with firms doing business with the Board of Education.
- d. All supplies purchased in small quantities and which experience indicates could best be purchased by awarding bids therefor in the aggregate, instead of by items, should be so purchased.
- e. Contract specifications should contain a printed section concerning the conditions which regulate the actions of a successful bidder and which at the same time inform him of the conditions the Board of Education is obligated to fulfill on each contract.
- f. Bids for supplies should be awarded without unnecessary delays.
- g. Standards should be established of all supplies in current use.
- h. All supplies should be purchased on standard schedules or lists, classified by trade groups, with descriptions or specifications complete and in accordance with trade terms, so that manufacturers and merchants may know at once, from a reading of a schedule, what is wanted and the Board of Education will be paying for what it gets.

- i. Price agreements should be secured in all cases where possible, covering specified periods of time. The time of agreement, the period covered, and the quantity of supplies purchased at any time during a price-agreement period should be determined by market conditions and the best interests of the Board of Education.
- j. There should be an employee appointed or designated to inspect and report on all goods purchased by the Board of Education.
- k. There should be provided a sample room in which samples of supplies used in the school system could be on exhibit for the convenience of bidders and the inspector of supplies.
- l. The present form of purchase order should be superseded by one of a standard size ( $8\frac{1}{2}'' \times 11''$ ) with provision made thereon for certifications of persons receiving goods, sufficiency of funds, etc.
- m. The purchasing officer should be authorized to issue orders for all supplies used currently and which are not special or unusual. The latter class should be approved by the superintendent of schools, or by the superintendent in charge of business affairs.
- n. The present procedure of receiving requisitions from schools for supplies to be issued from the general storehouse should be discontinued. All supplies requisitions should be sent direct to the storehouse. The present forms of requisitions should be superseded by one form for all schools and departments, issued in quadruplicate, with one copy to be used as a receipt for goods, and another to be left at a school or department with the goods delivered.
- o. A complete card record of all purchases should be established and kept currently up to date.
- p. The form of "register of orders" should be revised to eliminate the distribution columns now deemed unnecessary.

### **STORAGE AND DISTRIBUTION OF SUPPLIES**

- a. The responsibility and accountability for the receipt, storage and issue of supplies for general distribution to schools or departments, should be centralized in one department and under one head, with the exception of sewing supplies and certain perishable supplies for high school lunch rooms.
- b. All supplies, wherever possible, should be delivered to the general storehouse. They should be delivered, also, at such times during the year as will permit of proper assembling

and inspection, and the proper recording thereof, before they are forwarded to schools or departments.

- c. Standards should be established for all educational supplies, as to the quantity and quality of each article of supplies that may be used in the various grades and classes. The standards should be adopted only after a thorough study and in accordance with the best judgment of a committee of supervisors and principals as to the needs of each grade or classroom.
- d. The general storehouse should install a platform record or goods received sheet, a system of daily reports of goods received, issued, and returned to storehouse, bin or stock cards, a revised stores ledger, and a stores distribution register.
- e. There should be a relocation of supplies and of shops in the general storehouse. A motor power elevator should be installed for hoisting and lowering supplies in the general storehouse.
- f. There should be an extra clerk employed in the general storehouse.
- g. The present hired delivery service should be superseded by one owned by the Board of Education.

### **ACCOUNTING AND AUDITING**

- a. A classified, segregated budget should be prepared for each fiscal year's operations. The budget should show for each department, division, etc., the amount or amounts allotted to each, classified by functions and objects of expenditure, and by character of service, such as administration, operation, etc.
- b. The budget should indicate the financial and business policy and program of the Board of Education for a fiscal year, and should be a guide to administrative officers in carrying out this policy and program.
- c. The Board of Education should have submitted to it each year for making up the budget, detailed data on total and unit cost of previous and current operations, together with accurate inventories of supplies and equipment.
- d. The budget should be set up in a ledger and all purchase orders, work orders, etc., should be charged as encumbrances against the particular budget items from which they are payable, to establish the unencumbered balance in an item at any time for issuing additional orders, etc. Vouchers paid in liquidation of any purchase order or other

encumbrances should be charged to the budget item from which they are payable, thus determining the unexpended balances in the budget items or accounts.

- e. Statements should be prepared monthly showing the state of each budget account.
- f. The general ledger accounting system should be revised to eliminate all unnecessary bookkeeping entries and accounts, and to make possible the preparation of monthly statements of revenue and expense, and accurate departmental cost statements. These statements should show the current month's operations compared with the same month in the previous year, and be accompanied by a statement of assets and liabilities.
- g. The stores account in the general ledger should be used to exercise control over the storekeeper by means of current reports of goods received at and issued from the storehouse.
- h. All supplies and equipment returned to the storehouse should be accounted for by the storekeeper. All returned goods fit for further service should have a value placed on them and credit given in the proper accounts. Supplies returned, but unfit for use, should be disposed of in accordance with regulations governing such matters.
- i. There should be established a standard classification defining the articles to be included in the category of "supplies" and those to be included in the category of "equipment."
- j. A conservative policy should be adopted with respect to distributing the cost of the work of the buildings and grounds department as between repairs and improvements.
- k. Classified lists of all buildings, mechanical equipment, and furniture and fixtures belonging to the Board of Education, should be prepared for the purpose of determining the rate of depreciation to be charged off all property each fiscal year.
- l. The form of the voucher register should be revised to provide for showing expense controlling accounts instead of detail expense accounts. Also, the expenditure distribution register should be designed to show a clearer distribution of items of cost in each school.
- m. All miscellaneous cash collections should be deposited regularly with the secretary and credited to the respective departments which collected the receipts if received from sales, etc., in a department. If any of such collections are a proper offset to some expense account, they should be shown as such in statements of cost.

- n. Inventories should be properly checked and verified with records established for this purpose in the accounting department, and to exercise control over all property of the Board of Education.
- o. The procedure of handling invoices should be revised to expedite the paying of claims against the Board of Education and to permit of discounting invoices within the period for which cash discounts may be obtained.
- p. All claims against the Board of Education should be accompanied by certificates which state specifically what is being certified or approved, and no person should be required to certify or approve any document except the person who has knowledge of the fact to be certified or approved.
- q. The present form of voucher and voucher check should be combined so that the one writing, by carbon process, may show all particulars as to date, name of payee, amount of voucher, distribution of the amount, etc.
- r. Payrolls for principals and teachers should be prepared in the schools and a special form of payroll voucher check designed to eliminate the signatures to payroll.

### **GENERAL**

- a. The construction of new school buildings should be financed from sales of bonds issued on the serial plan, to distribute uniformly over the life of the property the cost of such construction.
- b. There should be a fire insurance fund established, to supersede the present arrangement with fire insurance companies, as policies now in force expire.
- c. Service and efficiency records should be established, to show the complete service record of each employee in the Board of Education and the character of service rendered by each.
- d. Supervisors should be relieved of all duties which are outside the scope of their departments, and which other departments are established to perform.
- e. The Board of Education should secure an administration building or suitable offices in which the executive and administrative departments could be centralized.



## I

**BUILDINGS AND GROUNDS DEPARTMENT****1. Organization**

Prior to 1913 there was a supervising architect and a supervising engineer, each in immediate charge of separate operations of the buildings and grounds department, but under the general direction and control of the committee on buildings and grounds. The duties of the supervising architect were "the designing and superintending the construction of new buildings and the general supervising of all work turned over to him by the committee, excepting the plumbing, ventilating and general steam engineering work."

The duties of the supervising engineer were "the designing and installation of heating, ventilating, power and plumbing plants for new buildings, the repairing and plumbing and remodeling of defective apparatus and plumbing in old buildings, and all matters pertaining to said plants and plumbing, including the operation of same, to make careful tests of fuel proposed for the various plants, and to furnish the committee on buildings and grounds statements thereof and recommendations as to quality and kind of coal best adapted for the economical operation of this plant. He shall also have in charge the repairing and remodeling of old buildings."

Since 1913 the position of supervising architect has been vacant and the supervising engineer has exercised the duties of that position in addition to his own, although there have been no new school buildings erected since that time. With the adoption of the revised rules of the Board early in the present year the supervising engineer has been in complete charge of the buildings and grounds department force without committee direction or control.

The personnel of the buildings and grounds department, under the direction and control of the supervising engineer with a summary of their duties is as follows:

**a. General Assistant**

The duties of the general assistant are of a miscellaneous nature and include following up contract work on schools, making certain inspection trips to schools in connection with janitor and engineering work, and any other work that may be assigned to him by the supervising engineer.

b. Draftsman

The duties of the draftsman are the preparing of all plans and drawings as may be required for repair or improvement work in schools.

c. Clerk

The duties of the clerk include the writing of purchase and work orders, copying of payrolls from foremen's time sheets, checking of invoices for purchases made by this department, and such other clerical duties as may be assigned by the supervising engineer.

d. Foremen of Repair Force (Five)

The duties of foremen include the immediate supervision and direction of mechanics and laborers on repair or improvement work and also the actual work of making repairs or improvements, the preparation of workmen's time sheets and distribution of the labor cost, the distribution of pay checks to workmen, inspection of certain coal deliveries, and such other work in connection with buildings and grounds as may be assigned by the supervising engineer.

e. Mechanics and Laborers

Repair and improvement work, under the immediate direction of their respective foremen.

f. Janitors and Engineers

In charge of school buildings and grounds, under the immediate direction of their respective principals.

**2. Maintenance and Improvement of Buildings, Grounds and Equipment**

a. Planning Work Program

An estimate is made each year of repairs and improvement work proposed to be done in schools in the succeeding year. The data is usually gathered by the supervising engineer in the course of his trips to school buildings. At budget making time the total estimated cost of the proposed work to be done in the following year is submitted by the supervising engineer to the Board of Education.

The following extract from the last estimate of the supervising engineer submitted to the Board on October 25, 1915, illustrates the form and detail in which the estimate was presented:

Heating and plumbing repairs for October and November, 1915.....\$ 1,600.00

## REPORT OF THE SCHOOL SURVEY

Heating and plumbing repairs for December 1, 1915, to September 30, 1916	12,000.00
General repairs, buildings and grounds for October and November, 1915.....	1,700.00
General repairs, buildings and grounds for December 1, 1915, to September 30, 1916 .....	18,000.00
Estimate on painting roofs and outside wood work.....	13,000.00
Estimate on painting interiors.....	8,000.00
Estimate on external stairs for 1916...	10,050.00

No further details were submitted to the Board because, as explained by the secretary of the Board, the supervising engineer was supposed to have discussed details with the chairman of the buildings and grounds committee.

The whole procedure of compiling the estimates and discussing the program of work was done very informally and there is no record available in the building department to show the buildings and specific jobs contemplated in the estimate or the extent to which the program has been carried out to date. The engineer states that usually his annual program of repair and improvement work had to be readjusted to meet the demands of principals for more work in their schools than he had planned upon or deemed necessary when arranging his work program. These demands were allowed by the chairman of the committee.

The procedure of estimating the cost of current work is handled in the same way as that described above in connection with the annual estimate. The cost of small jobs is not estimated in advance of doing the work. Special or large jobs may have an estimated cost determined in advance, but this formerly was merely for discussion with the chairman of the committee on buildings and grounds as a basis for deciding whether any given job should be undertaken. No record is made of the estimate, or of the actual cost if the work later is performed.

The buildings and grounds department has certain plans and data relating only to building and mechanical equipment erected or installed since 1904. Of the older buildings constructed prior to that

year, floor plans, specifications and other data are not complete. This is a great handicap to the department from an administrative standpoint, and makes it difficult for the engineer to plan his work intelligently or to be able to figure costs of proposed work in all cases with reasonable certainty as to the conditions to be met.

In connection with this report, information was requested of the department concerning the area of floor space in buildings, of grounds and walks around buildings, of the kind, age, and serviceability of heating and ventilating equipment in school buildings, and of the extent of radiation in building so heated. This is data which should be immediately at hand in any efficient building department and was so recognized by the supervising engineer, but portions only of it were available and most of this had not been completely verified or established in permanent forms.

The supervising engineer states that he had a pocket memorandum at one time of some of this data, but that he had discarded it because it was incomplete. He states further that his department has never had the engineering or clerical force necessary to gather all information relating to buildings, grounds and equipment, and that the cost of getting the information or the desirability of having it, never received the encouragement of any of the several chairmen of the buildings and grounds committee who had been in charge during his tenure as supervising engineer.

It is difficult to see how an important department like the buildings and grounds department could have been permitted for so many years to continue without the equipment and records usually deemed necessary for efficient and economical work, and which serve as the only means whereby accurate knowledge may be had of past operations and plans developed to meet future needs.

Although the buildings and grounds department has expended over \$500,000 for maintenance alone in the ten years ended June 30, 1915, this sum has been expended largely without any adequate system of records or reports to show the details of transac-

tions or their relation to any clearly defined program of action. It should be clearly understood that no question is raised in this report concerning the integrity or purpose of any official or employee of the Board of Education. It is the system, only, which is referred to as being weak and based on unsound business practices.

The records showing the work performed by the department and the manner of keeping the records are discussed in detail in the section below under the title "Recording the Work."

In work of the kind handled by the buildings and grounds department, with sixty-six or more school buildings all requiring different needs and constant attention, the only intelligent and efficient manner of meeting these needs and assuring each school of proper attention, is to plan in advance the requirements of each building and adjust the work and funds available in such manner as to assure equitable treatment to all.

It is suggested, therefore, that there should be an annual or periodic survey made of every school in the district to determine the repairs or improvements which are needed or desirable in each building. The findings should be tabulated and classified in accordance with the importance or needs in each case. The estimated cost of doing each job should be shown in the schedule. With this schedule as a basis, an adequate budget for the department could be prepared and a program of work could be laid out to fit in with the financial and business policy of the Board. The amount of repair or improvement work authorized for each school, based on the survey, should be set up in a budget ledger designed for this purpose.

As work orders were issued, the estimated cost could be set up as an encumbrance against the budget account of the school concerned, thus providing for the proper administrative control over the allotments. Reports of completed work would liquidate the encumbrance to the amount of the work completed on each work order.

By a system of cross indexing, it would be very simple to show the relation of the work completed or in progress to the schedule or survey charts, to indi-

cate the extent to which the program is being followed.

Progress reports showing this relationship, and the status of each repair or improvement job, should be submitted at such time and in such details as might be required for administrative purposes. No written reports on the work of the department have ever been prepared in the past for the Board or the chairman of the committee on buildings and grounds.

The buildings and grounds department should be completely equipped with all necessary plans, drawings and other records to enable the head of the department to size up a situation from the records of the department without the need of sending foremen around to the schools to get information which should always be on file.

b. Performing the Work

Each foreman usually assigns the men under his immediate direction to the various repair or improvement jobs authorized by the engineer. For this purpose the foremen make frequent visits to the office of the supervising engineer to report and receive their orders for new work. The engineer estimates that each of his foremen lose on an average an hour a day in making these visits to his office. This is admittedly a conservative figure. There are five foremen, each in charge of one of the classes of work, as follows:

Carpentry,  
Tinning,  
Plumbing and Steam Fitting,  
Electrical,  
Painting.

The foreman of carpenters and the foreman of tanners each gets \$125.00 per month, the foreman of plumbers and the foreman of electricians get \$5.00 per day each, while the foreman of painters gets 60 cents per hour. A conservative estimate, therefore, of the cost of this unproductive or lost time of foremen traveling to and from the supervising engineer's office, and waiting for interviews, would approximate \$900 per year.

The unfavorable location of the supervising engineer's

office has much to do with this lost time. Situated as the office is, in one of the down town office buildings, the engineer is out of direct contact with his foremen unless they come to him or he goes to them.

The force of mechanics and laborers on repair and improvement work varies largely with the time of the year when the schools are unoccupied for school purposes. During the summer months the department has its maximum number of workmen employed. For the five year period from July 1, 1910, to June 30, 1915, there was an average of approximately 81 mechanics and laborers per month employed during the three months of July, August and September. The average number of workmen per month for the other nine months of the year was 30. The figures for the fiscal year 1914-1915 show a considerable reduction in the number of workmen employed as compared with the average number of workmen employed for the four preceding years.

The figures are as follows:

Average Number of Workmen Employed per Month		
	For the 3 Mos. of July, Aug., Sept.	For the Other 9 Mos. of Year
Fiscal year 1914-15.....	52	21
Fiscal years 1910-11 to 1913-14 .....	89	33

These figures bear out the statements of the supervising engineer that he has been unable in the past few years to do as much work to school buildings as the needs of the buildings require owing to shortage of funds. The retrenchment in the year 1914-1915 is very evident. The maximum force of all classes of workmen during the five-year period under review was in the month of August, 1911, when approximately 139 men were employed in repair and improvement work.

The employment of a variable force of mechanics and laborers is not in the interest of efficiency and economy. Men employed temporarily only, are not inclined to put their best efforts in their work and require constant supervision. Furthermore, the best mechanics are not always available when it is necessary to increase the working force. These are



strong reasons for the adoption of a policy which will maintain a fairly constant force of employees all through the year, the work being distributed, wherever possible, over the year, instead of the bulk of it being done in two or three months of a year.

During the seven years previous to the fiscal year 1912-1913, there was expended for maintenance of buildings and equipment an average of \$51,473 per annum (exclusive of architect's fee). During this period the supervising architect was in charge of all maintenance work in buildings, exclusive of the heating, ventilating, and plumbing equipment, which was in charge of the supervising engineer. The architect was paid on a fee basis (5%), while the engineer was paid a straight salary.

For the three years (1912-1913 to 1914-1915), during which the supervising engineer has been in charge of all maintenance and improvement work, the average amount expended for maintenance was \$35,600 exclusive of cost of supervision. The supervising engineer states, in explanation of this difference in average maintenance cost per year for the three years of his administration as compared with the average maintenance cost per year for the seven years preceding his administration, that, while he has been unable, for lack of funds, to do all the work needed in the schools, yet the buildings and equipment have not been neglected any more than they were under the previous administration. He has been able to keep the maintenance cost down, he adds, by a closer attention to each job, eliminating non-essential work, and by using, at times, second-hand material or parts in repairs of equipment wherever it was considered that the material or parts would last as long as the equipment repaired.

The supervising engineer stated, further, that until the present year (1915-1916) very little work was ever done in the way of cleaning and revarnishing pupils' desks. This is usually one of the heavy items of maintenance cost in any large school system. Undoubtedly there are many economies in maintenance work which may be practiced under enforced conditions. The absence of cost records and other data, showing classes and kinds of main-

tenance work for which funds were expended in the buildings and grounds department is to be regretted. It is impossible, without records, to compare one year's operations with another, and by a close analysis of the work done in each school, establish some basis for a judgment as to the economy of expenditure and efficiency of men and material.

The maintenance cost should normally be high in this city where one finds so many old school buildings. The absence of a standard, uniform policy of construction and development of school property prior to 1903 is another factor tending to high maintenance cost. The school buildings taken over in 1903 to form the present school district No. 1, were constructed under the management and direction of eleven separate and independent school districts or boards existing at that time.

Many of the school buildings are inadequately equipped in the matter of plumbing, heating and ventilating systems. Nine school buildings have no sewer connections. To remove these defects and place all the buildings in efficient and sanitary condition will occasion considerable outlay, and this will in turn increase maintenance cost in the future, on the principle that a complete and modern plant will cost more to maintain than a partly equipped one.

Every facility should be provided the buildings and grounds department to perform its work without unnecessary expense or delays. The executive offices of this department should be located in the storehouse where the repair shops are now situated. This arrangement would eliminate the lost or unproductive time of foremen now consumed in visiting the engineer's offices in their present location.

The supervising engineer should be provided with an automobile, or other arrangement made whereby he can get around to school buildings without having to use trolley cars. Many of the school buildings are some distance from the trolley lines, which makes it inconvenient to depend on that service alone in visiting the schools, to say nothing of the cost in time of an executive walking from school to school or from trolley cars.

Foremen are allowed a small addition to their pay to

cover personal transportation, but it would seem a more desirable plan to provide motorcycles for those foremen who are in charge of different gangs working in different school buildings in the city.

c. Recording the Work

Requisitions and Work Orders

All repair and improvement work in schools prior to the current year was authorized by the chairman of the committee on buildings and grounds. This authorization was noted on a form of requisition made out by the supervising engineer and signed by the chairman. A requisition would be signed sometimes after the work was under way or completed, as in the case of emergency work, but usually the requisitions were signed by the chairman before any work was begun. With these requisitions as a basis for work authorized the supervising engineer, or his clerk, issued separate work orders to the foreman to do the work. With the adoption of the new rules of the Board, the requisition is no longer used. All maintenance or improvement work now arising in the department is done on the authorization of the supervising engineer alone.

The use of requisitions signed by the chairman of the committee on buildings and grounds authorizing all work of the department, was a protection to the supervising engineer, and would have been a means to trace any particular job, and its cost, from its inception to its completion. Unfortunately, however, no estimated cost ever accompanied a requisition and the work orders issued on the authority of a requisition were not referred to on time cards or other labor reports. Thus the connection between requisitions, work orders, time reports, and jobs or schools is broken, and impossible to trace in most cases.

It should always be possible, in work of the nature handled by this department to have a clear and continuous record showing how each job originates and the estimated cost of doing the work, as a basis for comparison later with reports of the completed jobs. It is not sufficient to know that a job has been authorized by proper author-

ity. It should be possible also to follow the progress of a job through the mass of work handled.

### Workmen's Time Cards and Reports

Each workman keeps a card on which he notes the schools in which he has been employed. The hours worked in each school is not usually reported. The schools are indicated on the time card by a code number, the code being printed for convenience on the reverse side of the card. These time cards cover a half month period. They are collected by the foreman and turned in to the engineer's office after the workmen receive their pay checks.

In addition to the time cards, each foreman keeps a "Foreman's Time Sheet" on which he distributes daily the cost, by schools, of the time of all workmen employed under his direction. This sheet covers the payroll period and is merely for the convenience of the foreman and retained by him. Neither the workmen's names nor the hours they have worked are shown on this time sheet.

From the foreman's time sheet each foreman makes out another report called "Time Sheet." These latter sheets show the names of each employee, the rates of pay, total amount due, the total hours worked for each day of the pay-roll period and the distribution of the labor cost by schools. The time sheets are certified correctly by the foreman and turned in to the engineer's office.

### Payrolls

From the "Time Sheet" referred to above, the clerk in the engineer's office makes out the payrolls for presentation to the accounting department of the Board for audit and for the issuance of payroll checks. The payroll is very similar in form to the "Time Sheet" with the exception that it does not show the hours worked by each employee for each day of the payroll period. The "Time Sheets" are filed in the office of the engineer after the payrolls have been prepared. Each foreman distributes the payroll checks to the men under his direction. Workmen sign the payroll at time of

receiving their checks, after which it is returned to the accounting department.

The present form of workmen's time card is unsatisfactory in design and incomplete in the information reported on it. It does not show the jobs on which the men have been working nor the hours engaged on each. The work orders issued by the department are numbered serially, but this number is not used or referred to in any labor reports. It is impossible to compile data which will be of use in controlling the cost of jobs, where labor reports are not submitted till some time after the work is done, and which show no reference to job number, or other documents originating the work.

The time cards should be signed to show the particular jobs worked on each day, the hours engaged on each, the name of the school, and the time traveling between jobs. They should be turned in at least daily, so that the cost records may be kept currently up to date. The time traveling between jobs should be apportioned at the close of a month, or other closing period, over all schools as an overhead cost.

The two forms "Foremen's Time Sheet" and "Time Sheet" referred to in the foregoing would be unnecessary with the adoption of daily time cards and reliable and accurate cost records. Foremen should not be required to do unnecessary clerical work. It is false economy to have five foremen at an average rate of \$5.00 per day each, calculating and distributing labor cost and making out payrolls. The form of payrolls made out by the clerk in the buildings and grounds department is merely copied from the "Time Sheet" prepared by the foremen, so that each foreman, practically, makes out the payrolls for the department.

A payroll sheet designed to show the same information contained on the present form of "Time Sheet" with the proper certifications, could be kept in the engineer's office and the time of workmen posted thereon daily from time cards. This would be the only summary of workmen's time necessary for payroll purposes. No distribution

of labor cost need be shown on the payroll. This distribution would be taken care of in a system of job cost cards or job ledgers, arranged in accordance with any desired system of classification of accounts.

Under such a system any workman's record may be traced back from the payroll sheets to the time cards and work orders, and show every job he has worked on, the class of work, time spent, etc. It would also establish a basis for a system of efficiency records, now lacking in this department.

#### Material Cost.

All material used in repair or improvement work is purchased as needed with the exception of such surplus material as may have accumulated in the shops from previous jobs. All material purchased is charged to the school for which it has been purchased. The distribution of the material cost is made by the supervising engineer from the invoices. For this purpose the form of certificate used by the buildings and grounds department, to approve the correctness of invoices for repair and improvement purchases, contains a section for the distribution of the charges by schools. Material drawn from the surplus stock in the shops is not charged to any school in which it is used on the theory that, as it was once charged to some school at the time of purchase, it cannot be again charged to another school.

This is probably the most cumbersome, expensive and inaccurate method of handling the material cost of repair or improvement work that could be devised. The labor cost may be distributed to schools in one month and the material cost for the same work charged in the next month or later months, according as the invoices are received from the dealers. The supervising engineer is practically the only one who can make the proper distribution to schools of the material cost when the invoices are received.

This work requires considerable of the engineer's time, time which should be devoted to the larger problems of the department. Under the section of this report dealing with the purchase of sup-

plies and equipment there are further references to unnecessary duties of the engineer in connection with the work of purchasing supplies.

The department should have a sufficient stock on hand of all supplies in current demand. (This is discussed in detail under the heading "Storage and Distribution of Supplies and Equipment," page 58.) When supplies are needed for work authorized, a requisition made out by the workman and approved by the foreman in charge, should be presented to the person in charge of supplies. This requisition would establish the charge to the job and school for the material used in the work. Any material returned to the storehouse should be credited to the job for which it had been issued.

With the adoption of a system of cost records referred to above, the elimination of unnecessary forms and procedure, and the establishment of a storeroom for repair supplies, the supervising engineer and his foremen would be relieved of the bulk of the office work now being performed by them. The supervising engineer would then be able to devote his skill and experience to the technical and administrative problems of his department and the foremen would be able to devote their whole time to the actual work of repairs or improvements.

### **3. Operation of Plant**

#### **Inspection Service**

According to the rules of the Board of Education in effect up to the adoption of the new rules early in the present year, janitors were directly responsible to the principals of schools. There is no reference in the old rules as to who shall have the general supervision and control over all janitors and engineers. This vagueness was responsible, in a measure, for conflicting orders or instructions issued in the past by the buildings and grounds department and the committee on buildings and grounds, concerning the duties of janitors and engineers.

In the absence of definite responsibilities delegated to any employee, outside of the principals, to inspect and report on the janitorial service in the schools, there has been



practically no supervisory control over this service. The buildings and grounds department has attempted in an informal way to look after the work of janitors and engineers, but it is stated in the department that owing to the facility with which janitors could go over the department's rulings to the committee on buildings and grounds, the department has always been slow to take any active part in the establishment of an efficient inspection service.

The importance and advantage of responsible control over janitors hardly need enumeration here. There is no school system of size in the country which is without some employee charged with the duty of supervising and regulating the work of janitors and engineers. Denver should have such an employee. The need in this city of an inspector, or foreman of janitors and engineers, is fairly demonstrated in the sections below referring to janitor's and engineer's salary schedule and coal consumption. His duties should include the instruction of janitors and engineers in the proper performance of their duties, the introduction of economies in the use of janitors' and engineers' supplies and equipment, and in the making of such reports on conditions in the janitorial service as may be required of him by the superintendent of schools to maintain this service on a high plane of business efficiency.

The importance of a janitor's work in a school building is beginning to be recognized more and more each year in school administration. The efficiency and economy of operation of a school plant is practically up to the janitor. He is the technical man on the job all the time. To his knowledge, intelligence and care, depend the proper working of the plant, and, to a certain extent, the results attained in the class room.

In certain schools and universities of this country the janitors have regular weekly or monthly meetings presided over by an inspector or chief engineer, who instructs them in different phases of their work. The janitors are encouraged, also, to offer suggestions which may improve the janitorial service. The possibilities for good in such meetings of janitors cannot be overestimated. The recognition of the principle involved, however, demands that a janitor shall be appointed and advanced on merit and receive remuneration in proportion to his services in accordance with a standard and equitable rule. This latter question is discussed in subsequent pages herein.

In another report on a study of school buildings and equipment in connection with the Denver school survey, the work of janitors and engineers is reviewed in some detail. For that reason, reference will be made here to such matters touching on the operation of buildings as were not discussed in detail or referred to in previous reports.

### Janitors' and Engineers' Salary Schedule

The present salary schedule for janitors and engineers has been in effect for many years without material change. Janitors and engineers have complained from time to time of their rates of pay, and these complaints have been met in various ways. Some of the janitors living outside of school buildings have been allowed a higher rental for their apartments than the schedule calls for. Some are given the standard allowance for rent and fuel (\$15.00 added to their salary) and in addition the Board pays their fuel bills. Others, living in school buildings, have been given an arbitrary advance.

The salary schedule is based on the number of class rooms in a building with certain extras for additional equipment, etc., as follows:

### Engineers' and Janitors' Salary Schedule

1 room	.....	\$10.00 per calendar month
2 rooms	.....	20.00 per calendar month
3 rooms	.....	27.50 per calendar month
4 rooms	.....	35.00 per calendar month
5 rooms	.....	40.00 per calendar month
6 rooms	.....	45.00 per calendar month
7 rooms	.....	50.00 per calendar month
8 rooms	.....	55.00 per calendar month
9 or 10 rooms	.....	60.00 per calendar month
11 or 12 rooms	.....	65.00 per calendar month
13 rooms	.....	70.00 per calendar month
14 rooms	.....	75.00 per calendar month
15 rooms and over,		\$5.00 per calendar month per room.

“In the above schedule the word room refers to rooms furnished with desk seats with one or more permanent teachers, and used for grade purposes and rooms used for kindergarten, sloyd, or cooking.

House rent and fuel, or their equivalent, \$15.00 per calendar month, are furnished except in one, two and three-room houses.

Engineers having charge of more than one boiler shall receive \$5.00 per month for each additional boiler.

Janitors having charge of an engine shall receive \$5.00 per month for each engine.

\$10 per month additional shall be paid for buildings having an auditorium.

Janitors shall receive \$10.00 per month additional for night school work.

For the months of July and August, engineers and janitors will receive half pay and shall be required to take charge of the property, but permitted to work elsewhere if they choose.

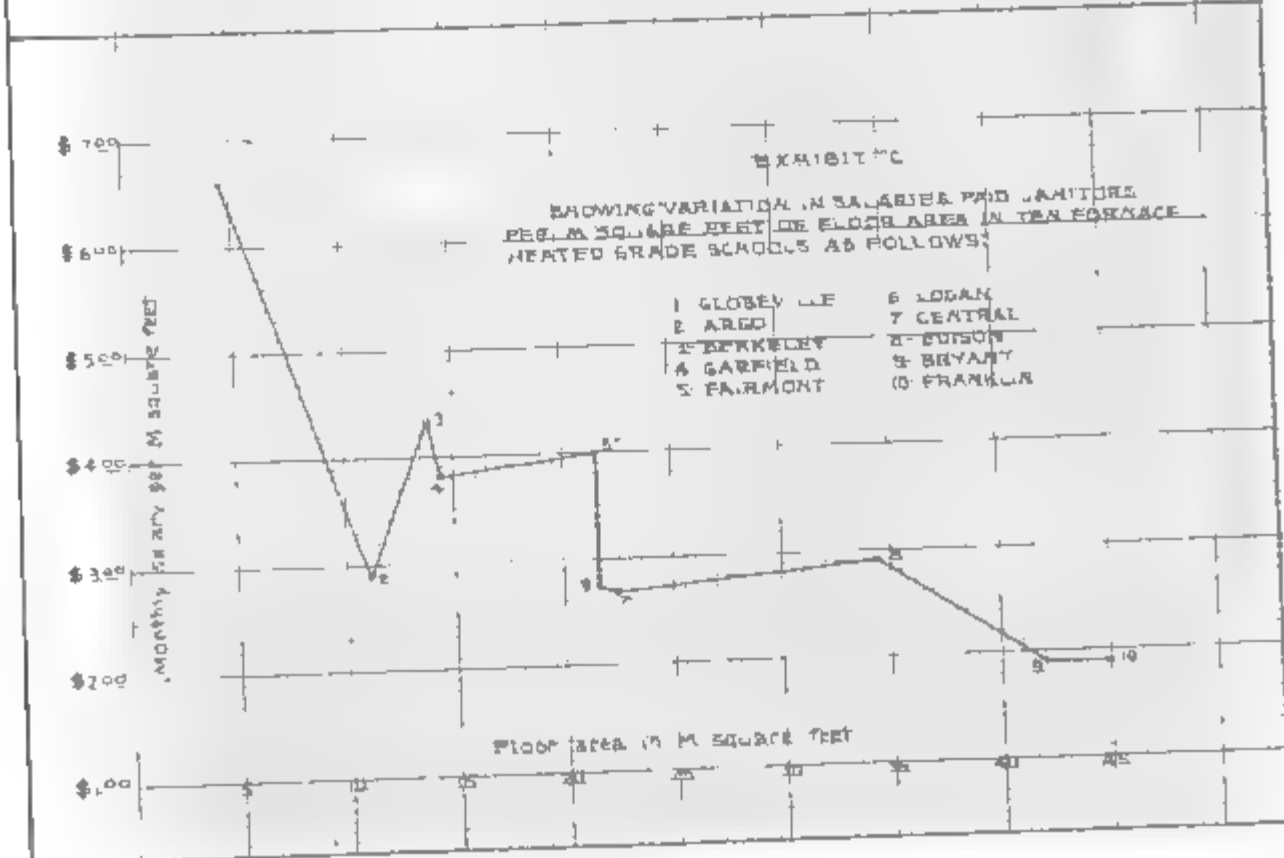
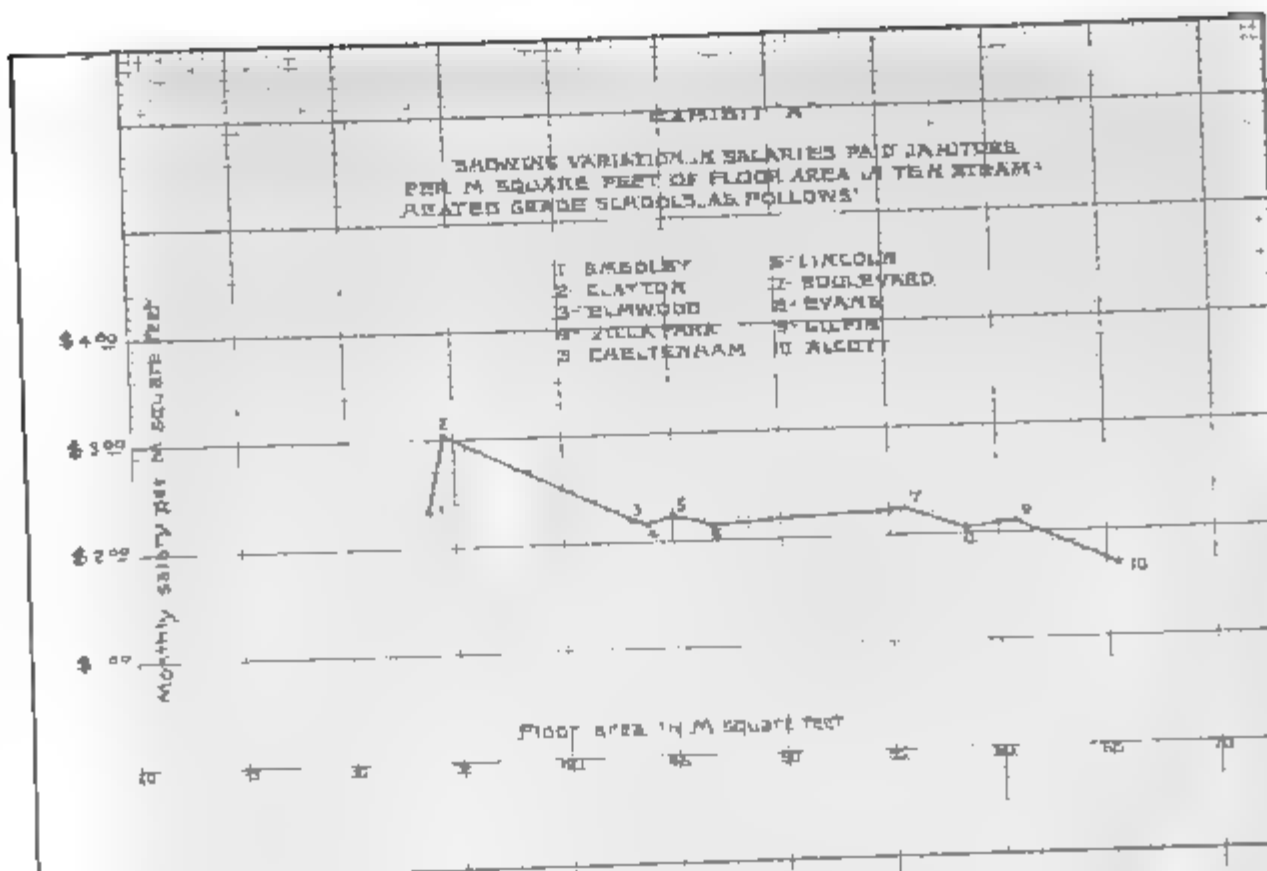
Whenever possible, vacancy shall be filled by promotion."

There seems to be no rule governing the rate of salary for high school janitors and engineers, or for salaries of janitors and engineers in grade schools which have both a janitor and an engineer. There are three grade schools which have a janitor and an engineer in each building. One of these engineers gets \$125.00 per month for a 30-classroom building, while another gets \$80.00 per month for a 31-classroom building. In the one case the janitor gets \$142.00 per month, in the other the janitor gets \$125.00 per month. A partial explanation for this discrepancy in rates is given by the buildings and grounds department. The school with the higher rates of pay was at one time a combined grade and high school. It reverted to a grade school with the erection of one of the present high schools, but the salaries paid the janitors and engineer were not materially changed.

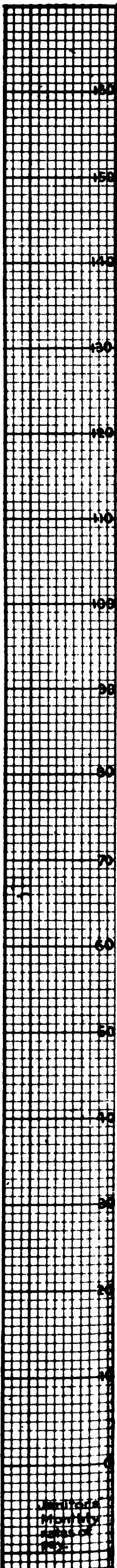
In the third case the salaries paid the janitors and the engineer in the same building are out of all proportion to the salary schedule. The janitor, with an engineer for an assistant in a 13-room building, is paid a rate as high as another janitor in a 20-room building who also tends to boilers, engine, etc.

The schedule makes no provision apparently, for period of service, area of grounds, area of walks, the number of trees to be attended to, or for the area of glass to be cleaned. The variations in those items is considerable as between the different buildings, as will be seen from the accompanying exhibits. They are commonly recognized today in school administration as factors to be considered in any adjustment of janitor salary to service rendered.

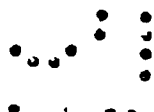
To emphasize the need of a readjustment in the present rates





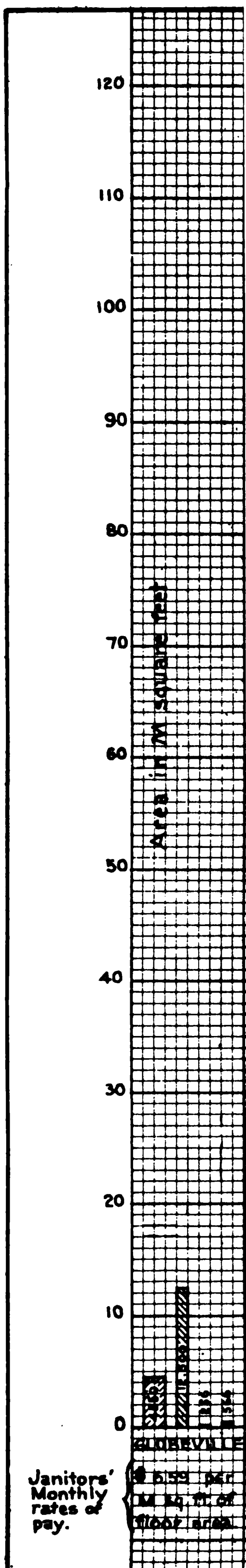


1  
S  
i  
d  
l  
l  
s  
e  
s  
r  
  
h  
n  
s  
d  
r  
  
d  
n  
e  
e  
d  
r  
l  
r  
  
d  
d  
r  
f  
h  
  
r  
r  
e  
e  
s  
  
e  
l









### Janitors' Monthly rates of pay.

6.59 per  
sq ft of  
floor area

1 g  
i- d  
d l  
l l  
s s  
e s  
s r  
  
h h  
n n  
's s  
d d  
r r  
  
d d  
n n  
e e  
e d  
d r  
i- i  
l l  
r r  
  
, ,  
d d  
  
l- l  
r r  
f f  
h h  
  
i- i  
i- i  
i- i  
r r  
e e  
e e  
s s  
  
e e  
l l



of salary for janitors and engineers, the accompanying exhibits were prepared. In order to make the comparisons reasonably fair, the buildings selected were grouped according to conditions in each which are common to all of a group. Outside building dimensions were used in all cases for the reason that these are the only measurements available in the buildings and grounds department. The areas used were furnished by the buildings and grounds department and have not been independently checked or verified.

Inasmuch as janitors are paid on the class room basis, with certain extras for extra equipment without any mention in the rules as to ground areas and all the other factors referred to in the foregoing, exhibits "A," "B," "C" and "D" have been plotted on the cost of janitor service per floor area.

Exhibit "A" shows the variation in monthly salaries paid janitors per thousand square feet of floor space in ten steam-heated school buildings. These ten buildings were selected by the supervising engineer as being comparable in most respects for this exhibit. All "extras" paid the janitors in these buildings were omitted to reduce their salaries to the basis on which they are paid alike for janitor service. Each janitor of the ten lives in his school building. Thus the cost per thousand square feet area for each building is taken on a fairly uniform basis.

Exhibit "B" shows, for the same ten steam-heated buildings, the variation in areas of floor space, grounds, walks, and glass for each building.

Exhibits "C" and "D" show, for ten furnace-heated buildings, the variation in monthly salaries paid janitors per thousand square feet of floor space, and a comparison of areas of floor space, glass and grounds and walks for each building.

These exhibits would seem to prove the limitations to a classroom standard of payment for janitor service. The varying types of school buildings in this city would of themselves make a classroom basis alone an inequitable one for such standard. Some buildings have large corridors, wide stairways, and large basements, while others with the same number of classrooms have smaller corridors, stairways and basements.

There are, of course, many and variable conditions to be taken into account to arrive at a salary basis which will

be fairly just to all concerned. Atmospheric conditions and character of population in each school zone, the condition of streets and walks with respect to the dirt tracked into buildings, these are some of the conditions which would have to be considered in a salary schedule for janitors. It is also commonly recognized that class-rooms, locker-rooms, etc., require more effort to clean than hallways. This survey did not permit of sufficient time to give an exhaustive study to all these conditions. The points raised here are suggestive only of the need for a change of the present salary schedule.

In some of the schools the flat rate per room may approximate the amount that would be allowed on a floor space, ground area, or other basis. A standard rate, however, should be adopted for each class of work performed by janitors. This rate must necessarily be arbitrary and in accordance with the compensation deemed adequate to the service rendered.

#### Coal Consumption

Janitors make no regular reports to the buildings and grounds department concerning coal consumption or balance remaining in the bins. They were required at one time to report monthly the quantity of coal received, quantity used, and approximate balance in the bins. They were also required to report the outside temperature of the weather. These reports were found of little value, the department states, because the janitors had no means of weighing coal and their reports on the weather were very conflicting and unreliable. Janitors have been furnished, however, with small printed cards showing the approximate cubical capacity of coal bins of certain sizes, as a basis for reports on quantity of coal on hand.

In order to ascertain the relation of coal consumption to floor area in school buildings, as a basis for judgment as to the relative efficiency of mechanical plants and janitors and the equity of the present flat rate compensation to janitors for engines and extra boilers, exhibits "E," "F" and "G" are submitted.

Exhibit "E" shows the points of variation in average annual cost of coal for thirty-three steam-heated grade school buildings, based on the total cost of coal delivered to these buildings for the two years of 1914-1915 and 1915-1916, in the absence of any reliable data on consumption of coal. The cost includes, also, the coal used by janitors who

live outside their school buildings. There are no records available showing, in each case, the amount of coal used by janitors as distinguished from the amount used by the school proper. Not more than 5 or 6 of the steam-heated schools compared would be affected, however, by the coal used by janitors who live in private dwellings.

The straight line indicates the mean or average annual cost of coal for thirty-three buildings. The points and numerals shown in this exhibit indicate the school buildings and the floor area and the total cost for each.

It will be seen from this exhibit that fifteen buildings are over the average cost and eighteen below the average cost. The cost of coal instead of tonnage consumption is used here owing to the many different kinds of coal used in school buildings. Some buildings use a greater quantity of comparatively cheap coal, while others use a greater quantity of the higher priced coal. The kinds of coal and prices paid are shown on page 36.

This exhibit indicates, further, that coal consumption or cost bears a direct relation to the floor area of a building. This fact should be of value in establishing a basis for compensation of janitors for heating and ventilating service, as distinguished from the present flat rate of \$5.00 per month for an extra boiler and \$5.00 for an engine. To show more clearly the variation in coal cost as between the different steam-heated buildings plotted in exhibit "E," the schools compared are shown in table "A," grouped according to the class of steam-heating and ventilating plants in use.

Exhibit "F" is plotted to show the variation in average cost of heating ten furnace-heated grade school buildings on the floor area basis.

Exhibit "G" shows the curve of variation in average unit cost of coal per thousand square feet of floor area for the thirty-three steam-heated buildings and for the ten furnace-heated buildings. This exhibit brings out in a very graphic way the extraordinary fluctuation in unit cost of heating per thousand square feet of floor space.

The various types of buildings and mechanical equipment taken over in the consolidation of schools in 1903 offer a possible explanation for some of this variation in cost of heating. Another explanation may be found in the different kinds of coal used. Of the average annual total value of all coal used in grade school buildings for the

### Table "A"

Giving names of the 33 steam-heated grade schools plotted in Exhibits "E" and "G" and grouped according to heating systems used. The numerals opposite the names of schools in this table correspond to numerals used in Exhibits "E" and "G."

Heated with steam, direct radiation and indirect for ventilation:

4 Bromwell  
5 Byers  
15 Fairview  
19 Hyde Park  
23 Montclair  
25 Sherman  
28 Swansea  
29 University Park  
33 Wyman

Heated with steam, direct radiation and fan for ventilation:

3 Boulevard  
6 Cheltenham  
9 Columbus  
10 Corona  
12 Elmwood  
13 Emerson  
16 Garden Place  
18 Grant  
20 Lincoln  
22 McKinley  
24 Park Hill  
26 Smedley  
27 Steele  
30 Villa Park

Heated by Plenum only:

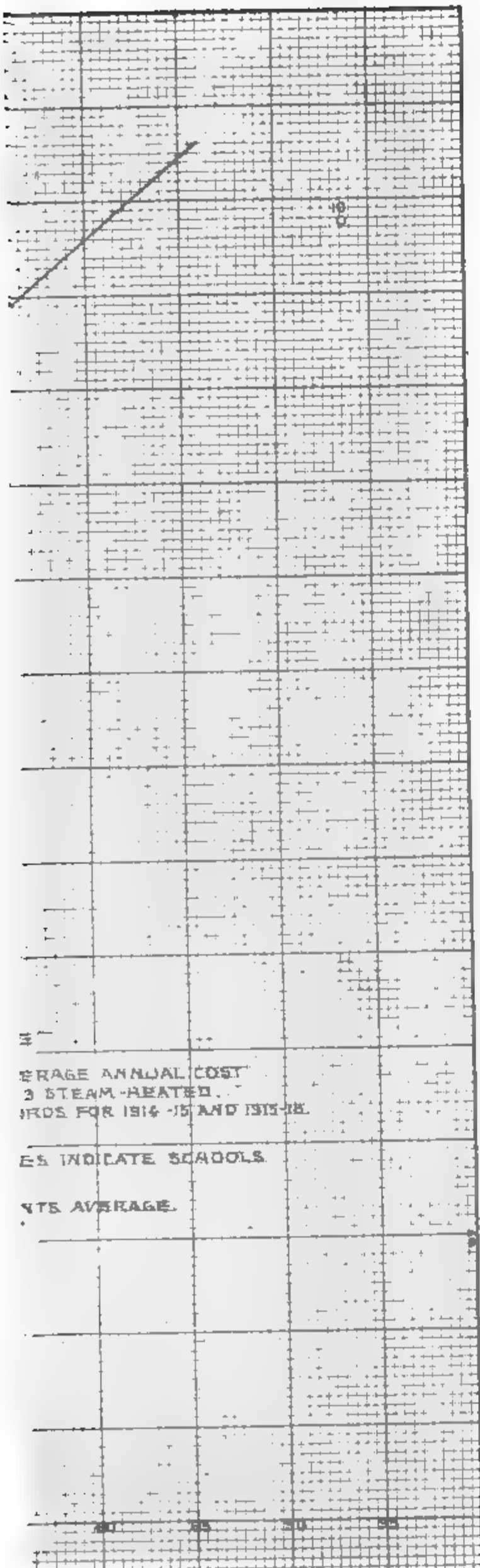
8 Columbian  
14 Evans

Heated with steam, direct radiation and indirect for ventilation; also direct radiation and fan for ventilation:

1 Alcott  
11 Ebert

Heated with steam, direct radiation and fan for ventilation, and by Plenum system also:

2 Ashland  
7 Clayton  
17 Gilpin  
21 Mitchell  
31 Webster  
32 Whittier



AVERAGE ANNUAL COST  
OF STEAM-HEATED  
SCHOOLS FOR 1914-15 AND 1915-16.

ES INDICATE SCHOOLS.

YTS AVERAGE.

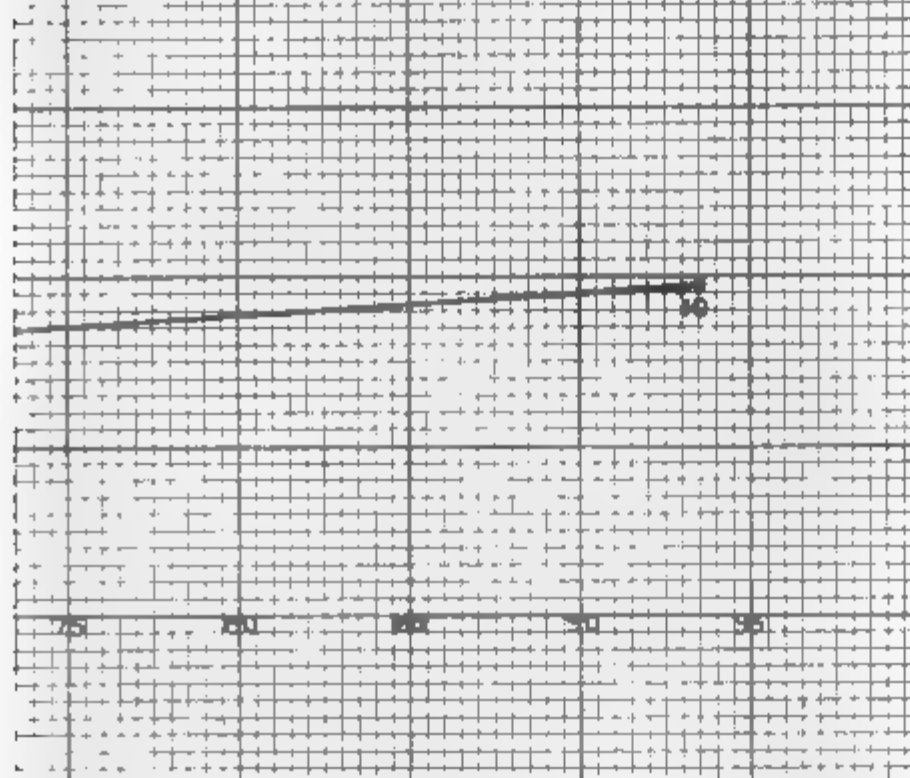




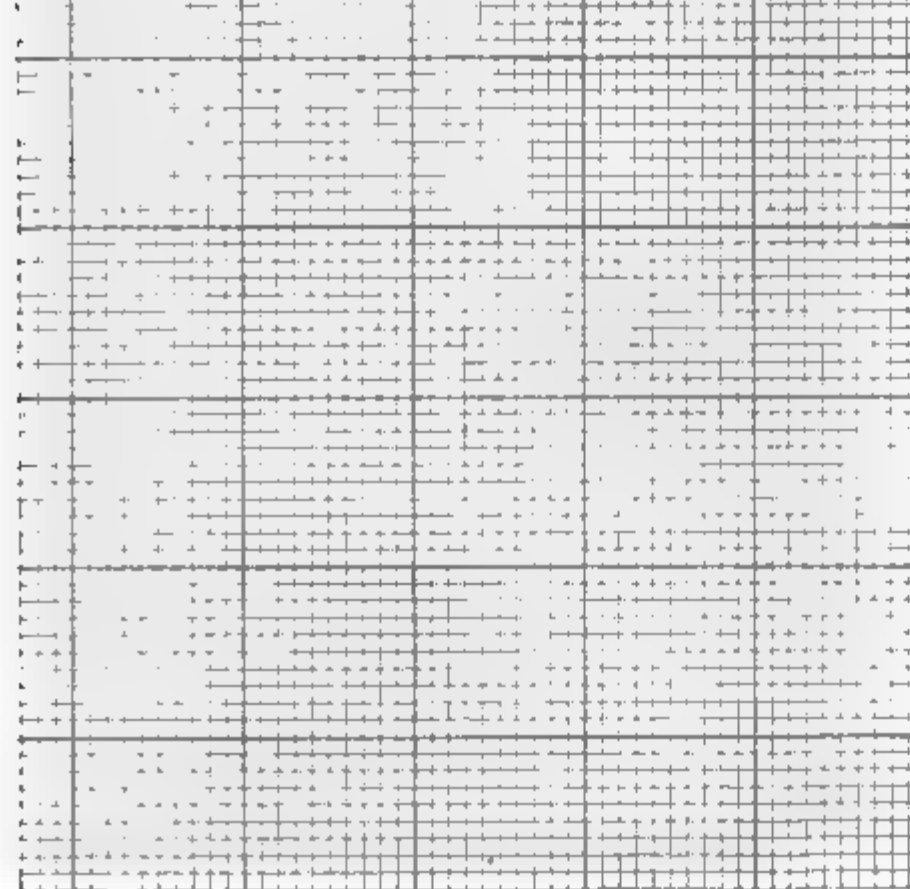
AVERAGE ONLY COST OF COAL PER  
 100 STEAM-HEATED GRADE SCHOOLS  
 STEAM-HEATED GRADE SCHOOLS SHOWN  
 18 AND 1915-16

AIR-HEATED BUILDINGS AND  
 WATER-HEATED BUILDINGS

BUILDINGS



AIR BUILDINGS





**Table "A"**

Giving names of the 33 steam-heated grade schools plotted in Exhibits "E" and "G" and grouped according to heating systems used. The numerals opposite the names of schools in this table correspond to numerals used in Exhibits "E" and "G."

Heated with steam, direct radiation and indirect for ventilation:

4 Bromwell  
5 Byers  
15 Fairview  
19 Hyde Park  
23 Montclair  
25 Sherman  
28 Swansea  
29 University Park  
33 Wyman

Heated with steam, direct radiation and fan for ventilation:

3 Boulevard  
6 Cheltenham  
9 Columbus  
10 Corona  
12 Elmwood  
13 Emerson  
16 Garden Place  
18 Grant  
20 Lincoln  
22 McKinley  
24 Park Hill  
26 Smedley  
27 Steele  
30 Villa Park

Heated by Plenum only:

8 Columbian  
14 Evans

Heated with steam, direct radiation and indirect for ventilation; also direct radiation and fan for ventilation:

1 Alcott  
11 Ebert

Heated with steam, direct radiation and fan for ventilation, and by Plenum system also:

2 Ashland  
7 Clayton  
17 Gilpin  
21 Mitchell  
31 Webster  
32 Whittier

fiscal years 1914-1915 and 1915-1916, anthracite coal at an average price of \$5.20 per ton represents over 57 per cent of the total. Anthracite coal is used extensively by schools in this city because of its non-smoke-producing quality, and also because it is slow-burning and therefore does not require the whole time of the janitor for furnace work.

The supervising engineer offers partial explanation for some of the variations in coal cost in schools. The Clayton school, for example (\$30.69 per M. square feet), he says is operated continuously from the time the school opens in the fall until it closes in the summer. This is the only public school in the city, with one or two exceptions, which operates continuously, in accordance with the views of the principal of the school on heating and ventilation. This school is giving more than the standard quantity of air per pupil, and also, the equipment is old and slightly under capacity. The Ebert school, as another example, which costs \$9.05 per thousand square feet of floor area for heating, is not operated continuously, but it is without full ventilation, the engineer states. The ventilation, he adds, is more in name than in fact. Further, the Ebert school uses only the lower priced coals, whereas the Clayton school uses more of anthracite coal than of any other kind.

None of the public schools of Denver has any smoke-consuming appliances. The introduction of such appliances in schools would occasion considerable outlay at the start but they would pay for themselves in time in the economy effected in the purchase of lower-priced coal. The schools are unable to use smoke-producing coals, the lower-priced coals, because of a smoke nuisance ordinance in this city.

From the findings disclosed in the foregoing data and exhibits relating to salaries of janitors and engineers, and to coal consumption, the following suggestions are made:

- a. That a detailed study, along the lines suggested previously herein, be made of the conditions surrounding the work of cleaning and caring for each school building.
- b. That the compensation allowed janitors for the cleaning of buildings be based on the total floor area, with such additional allowances for the cleaning of laboratories and classrooms as would compensate for the additional labor over the flat rate for all floor area.
- c. That compensation be allowed for the care and clean-

ing of grounds and walks, and the care of lawns and trees, at different rates according to areas and number of trees.

- d. That compensation for heating and ventilating be proportional to floor area.
- e. That compensation for cleaning windows be commensurate with the frequency with which local conditions require windows to be cleaned and the area of glass cleaned.
- f. That a system of grading and advancement of employees in the janitorial service be established, with minimum and maximum salary rates for each grade, in recognition of superior work and length of service.
- g. That a thorough study be made of the heating and ventilating equipment in the schools with the object of determining the most economical coal to be used and wherein the operations of the plants may be improved.

The survey report by Dr. Lewis M. Terman on buildings and equipment, testing the efficiency of the heating and ventilating plants from data on temperatures collected in classrooms, may be read with interest in connection with the exhibits and data submitted here on the coal cost of heating school buildings.

#### Analysis and Test of Coal

It is not customary to test and screen all coal delivered to school buildings. The portion of the coal delivered in the summer months, about one-third of the annual quantity used, was tested, it is said, as to screen specifications. No tests were made of the balance delivered to schools. The supervising engineer stated that the department has instructed janitors and engineers to reject unsatisfactory coal or to advise the department at once whenever coal is unsatisfactory. It is said that no complaints have been received from janitors or engineers this year, and that no coal has been rejected. In the course of a visit to one of the large grade schools in connection with this survey, the janitor made a vigorous complaint against the quality of coal he had been receiving this year. He gave no reasons why he had not rejected the coal or complained to the business office.

It is very loose and unsatisfactory to leave such an important.

matter to subordinate employees. The school district purchases approximately \$45,000 worth of coal annually. The coal is not purchased on the B. T. U. basis of heat value, but the specifications on the different kinds of coal call for certain percentages of nut, pea, slack, etc., in deliveries, and that coal shall pass through or over various sized screens, according to the classes of coal delivered. The best interests of the Board of Education would require that close watch by a competent employee be given at all times to coal deliveries. It is inconsistent, at least, to have detailed specifications and then neglect to see that all deliveries are in accordance with the specifications.

The kinds of coal used during the fiscal year 1915-16, and the prices paid, are as follows:

Firm A

Bituminous nut from Yampa Valley or Big Four..\$4.15

Firm B

Bituminous slack from Yampa Valley or Big Four. 2.39

Lignite slack from Russell Deep Vein..... 1.69

Firm C

Bituminous lump from Walsen mine..... 4.50

Anthracite No. 6 from Ruby.....

Washed Smithing from Segundo County..... 5.10

Firm D

Bituminous nut from Bear River..... 4.15

Lignite lump from Puritan..... 3.30

Bituminous pea from Bear River..... 2.90

Firm E

Lignite lump from Frederick..... 3.30

Lignite nut from Frederick..... 2.40

As an example of the detail in which contract specifications are made and on which the Board pays for its coal, the following extract from one of the coal contracts is submitted:

“The several classes of coal to be delivered under this contract are to be equal in grade to the following specifications, to-wit: Nut to consist of not less than 90% nut, 5% pea and not more than 5% slack must



pass through a  $2\frac{1}{2}$ " screen and over a  $1\frac{1}{4}$ " screen; lump to consist of not less than 85% lump and egg, 10% nut and not more than 5% slack and must be prepared over a  $2\frac{1}{2}$ " screen; pea to contain not more than 5% slack and must pass through a  $1\frac{1}{4}$ " screen and over a  $\frac{1}{2}$ " screen. All coal must be free from bone, slate, dirt and dust and shall not have been leached or subjected to weather exposure."

All coal delivered to schools should be inspected to determine whether the deliveries are in accordance with the specifications. It is suggested by the supervising engineer, that the most effective way to inspect all coal used by the schools would be for the Board of Education to have its own central yards near the railroad tracks, to which all coal purchases could be delivered in carload lots. By this means inspection could be made of every car of coal used in the schools and the quality determined at once and not left to the judgment of janitors and engineers, after the coal has been put in the bins.

The bin capacity of most of the schools is so small that only a portion of the annual supply can be stored at one time in a school. During the summer months, when approximately a third of the total coal requirements is delivered to the schools, these deliveries are made from carloads on railroad sidings consigned to the coal dealers. This arrangement permits of one of the foremen of the buildings and grounds department to be present to inspect the coal before it is delivered to a school.

The other two-thirds of the coal supply, however, is delivered as required during the year and comes from the dealers' coal yards. This makes it inconvenient to inspect each delivery before it gets to a school, and, besides, the foreman who does the inspection work in the summer is engaged then and later in making repairs and supervising repair gangs. The tendency, then, in the absence of some one person charged with the duty of inspecting all coal deliveries, is to take a chance or depend upon the janitors reporting unsatisfactory coal.

Considering these conditions, the plan suggested by the supervising engineer offers possibilities for safeguarding the interests of the School Board and at the same time of possible economies in the purchase of coal. The plan is worthy of consideration and study. The cost of handling and de-

livering coal from a central yard under the control of the Board of Education should be considered in connection with the uncertainties surrounding coal deliveries under the present system.

### General Supplies

An average of approximately \$4,000 per year is expended for custodial or general supplies. This is an average of \$57.14 per school for 70 schools receiving supplies. This is a very small average considering that general supplies include floor brushes, brooms, cleaning soaps and powders, toilet paper, paper towels, toilet soap, mops, engine oils, packing and many other general supplies used in the operation of a school building and mechanical equipment.

An analysis of the articles of general supplies delivered to schools for the two fiscal years 1913-14 and 1914-15 shows that floor brushes constitute an average of over 30 per cent of the total, or \$1,284.00 per annum. The following table shows the quantity and value of floor brushes used in sixteen grade schools for two years 1914-15 and 1915-16:

### Floor Brushes

School	No. of Classrooms	Floor Area Outside Dimensions	1915-16		1914-15	
			No.	Value	No.	Value
Alcott . . . . .	20	65,520	15	\$37.89	21	\$35.74
Boulevard . . . . .	24	55,744	11	15.08	15	39.30
Cheltenham . . . . .	20	45,090	27	49.56	10	23.31
Clayton . . . . .	20	34,568	13	34.33	8	17.58
Columbian . . . . .	13	29,625	13	26.65	10	21.28
Columbine . . . . .	17	48,000	12	25.25	5	7.97
Evans . . . . .	20	58,500	11	26.94	17	39.51
Garden Place . . . . .	24	37,680	13	32.23	24	30.80
Garfield . . . . .	9	14,420	2	4.60	9	11.89
Gilpin . . . . .	23	60,888	4	10.60	17	31.92
Hyde Park . . . . .	14	47,970	7	18.90	16	25.12
Lincoln . . . . .	21	46,000	13	33.76	25	45.56
Mitchell . . . . .	23	40,500	9	22.10	9	20.64
McKinley . . . . .	14	30,675	13	33.86	27	36.15
Villa Park . . . . .	20	43,890	30	45.25	23	40.57
Whittier . . . . .	31	65,040	22	56.92	17	78.99

The prices paid for floor brushes during the current fiscal year ranged from 44c to \$3.00 apiece, according to the size and quality. Undoubtedly, the frequency of sweep-

ing floors and the area swept has something to do with the quantity of brushes used, yet the variation in quantity and value of brushes for schools with similar areas and conditions points to the lack of any standards governing the quantity and kinds of brushes that a school may use in its work.

This lack of standards is evident all through any comparison of the various kinds of supplies used in the schools. With the exception of a nominal control over the issues of supplies from the general storehouse, no employee seems to be responsible for the kind and quantity of supplies that may be issued to janitors, and of the uses to which the janitors may apply them. The question of the quality of supplies is important as explaining an excessive use of any article in the schools. This matter is discussed in another part of this report in connection with the purchase of supplies.

From Dr. Terman's report on the building situation, the frequency of cleaning and the use of supplies would appear to be a matter decided largely by the janitor, although the rules of the Board concerning janitor's duties definitely state certain requirements of janitors in this respect. The exercise of independent judgment on the part of janitors is strikingly illustrated by Dr. Terman in his report in the case of the two schools which eliminated toilet paper because of the wasteful use by the pupils.

The small average of \$57.14 per year per school for general supplies is due in a certain measure, it would appear, not so much to unusual efficiency in the use of supplies as to conditions such as the following:

- a. The lack of supervisory control and direction of the janitorial service to see that each janitor is properly cleaning and caring for his building.
- b. The absence of wash basins in toilets in many of the schools, thus reducing the cost of soap and paper towels.
- c. The use of Ivory soap instead of the more sanitary liquid soap for toilet purposes.
- d. The infrequent use of sweeping compound or sawdust in sweeping classrooms and halls. Dr. Terman's report shows this infrequency of use, although the rules of the Board require daily use on all floors.

- e. The infrequent use of floor oil. When floor oil is applied it is done by repair department men and thus charged to repairs. Such floor oil as is purchased, therefore, is not charged to general supplies.

The following table shows the leading articles of general supplies making a total of \$3,741.00, or 79 per cent of the total average annual consumption of general supplies for the two years 1914-15 and 1915-16, and the average cost per school for each item. The balance of the supplies consist of miscellaneous items.

General Supplies		
Articles	Av. Annual	Av. Cost
Cleaning Supplies	Cost	per School (66 Schools)
Oil Soap .....	\$ 138.00	\$ 2.09
Gold Dust .....	91.00	1.38
Savogran .....	10.00	.15
Sapolio .....	11.00	.17
Mops .....	56.00	.85
Floor Brushes.....	1,204.00	19.46
Sweeping Compound and Sawdust .....	208.00	3.15
Sponges .....	272.00	4.12
Dusters (cloth).....	227.00	3.44
Toilet Supplies		
Toilet Paper .....	363.00	5.50
Ivory Soap .....	121.00	1.83
Paper Towels .....	440.00	6.66
Disinfectants		
Fumigation .....	116.00	1.76
Disinfectant .....	73.00	1.11
Engine Supplies		
Cylinder Oil .....	154.00	2.33
Engine Oil .....	72.00	1.09
Packing .....	105.00	1.60

There should be definite standards established regulating the quantity and kinds of supplies used in the operation of all school buildings. These standards should be based

on a thorough study of the needs of each building as determined by conditions in and around each building. The determination of those standards could be undertaken with advantage in connection with the study recommended to revise the janitors' and engineers' salary schedule.

The standards established for janitors' supplies should be a basis for the issue of all such supplies from the storehouse, and no supplies should be issued to a janitor but in accordance with such standard, unless good reason accompanies an unusual request for supplies. Before a janitor may receive additional supplies, classified in property records as equipment, he should produce the old equipment (or its parts) that is being replaced.

### Janitors' Reports

Janitors should be required to report monthly the following information on blanks furnished them for this purpose:

- a. Total quantity of coal delivered to their school during a month, the approximate quantity consumed in a month, and the balance in the bins at the end of a month. The basis for estimating the quantity of coal consumed could be established by measuring the capacity of wheelbarrows or other containers used in feeding the fires, and keeping a record of such measures. The balance in the bins could be determined from the cards already furnished janitors for this purpose.
- b. Readings of gas and electric light meters each month, and any other information relating to the use of gas and electricity in the schools as an explanation for an increase in the cost of gas and electricity in any school.
- c. A statement of all repairs made by janitors in a month, with the nature of the repairs, the material used, and the time engaged on each job.
- d. A statement showing the daily operation of the heating and ventilating appliances.

## II

### PURCHASE OF SUPPLIES AND EQUIPMENT

#### 1. Organization

According to section 4 of Rule 111 of the Board of Education relating to Duties of Committees, in force up to the beginning of the present calendar year, the committee on supplies was "the purchasing agent of the Board." Section 10 of Rule VI, relating to Duties of Secretary, stated that it was part of the duty of the secretary, "under the direction of the committee on supplies, to supervise the purchase of all supplies, etc., covered by requisitions passing properly through his office."

It would appear from the language of section 4, quoted above, that the committee on supplies as the "purchasing agent of the Board" would have directed and supervised all purchases of supplies of every description required by the Board of Education for any department. This was not done in practise. While the secretary was required "to supervise the purchase of all supplies, etc.," his supervisory capacity was limited to "requisitions passing properly through his office."

All material and supplies for the buildings and grounds department, for example, were not made on requisitions passing through the secretary's office. Further, such articles were purchased under the direction and supervision of the committee on buildings and grounds instead of the committee on supplies.

The purchasing function, therefore, was divided. There were other minor divisions purchasing supplies independently of the committee on supplies. All the divisions of purchasing as existed under the old rules continue to exercise this function, pending the reorganization of the business administration provided for in the revised rules adopted in January, 1916. The personnel engaged in purchasing supplies, and the classes of supplies purchased, are as follows:

##### a. Supervising Engineer

Purchase all material and supplies required in the repair and improvement of school buildings and the operation of the offices of the buildings and grounds department, including coal and wood for fuel for school buildings.

b. Supply Clerk

Purchase all supplies used in the education department, janitors' and general supplies for the operation of school buildings (exclusive of coal and wood), and certain supplies for high school lunch rooms. Assisting the supply clerk there is one order clerk.

c. Directress of High School Lunch Rooms

Purchases all perishable supplies and certain food and other supplies not in storehouse.

d. Domestic Science Teachers

Purchase perishable supplies in small quantities in the nearest groceries, etc., to each school.

e. Principals and Teachers.

Purchase those supplies and equipment chargeable to the contingent fund.

In addition to this decentralization of the purchasing function there have been frequent changes in the personnel of the committee on supplies and in the office of the supply clerk. While the secretary theoretically supervised the purchase of all educational and general supplies, the actual work of preparing specifications, securing bids, and purchasing in many cases without the action of any committee (as in the case of supplies costing less than \$20.00), was done by a superintendent of supplies up to April 28, 1915.

On that date the position of superintendent of supplies was abolished by the Board but the incumbent of the position continued to perform the same duties, under the title of assistant secretary, until May 12, 1915, when the position of assistant secretary also was abolished and the former superintendent of supplies and assistant secretary ceased to be connected with the Board of Education.

From May 13, 1915, the work of the former superintendent of supplies has been in charge of a "supply clerk," a clerk who, previous to April 1, 1915, had worked only part time on clerical duties in this purchasing division. Between May 12 and 25, 1915, there was no committee on supplies, but a member of the previous committee continued to perform the duties of the committee. From May 26 to September 15, 1915, a new committee on supplies with a different personnel from the previous committee, supervised the purchase of supplies.

On September 15, 1915, the committee on supplies was discontinued by Board action. From that date the superintendent



of education and the secretary performed the duties of the committee on supplies until October 13, 1915, when a new committee was formed with a change in membership. On January 12, 1916, this committee, also, was discontinued with the adoption on that date of the new rules of the Board of Education. Since that date, the superintendent of schools and the secretary have supervised and directed the work of purchasing such educational and general supplies as were not secured on annual contracts in the beginning of the school year.

These frequent changes in "purchasing agents" and in employees in direct charge of the work of purchasing were not made in the best interest of the Board of Education. They demonstrate the need of a fixed policy and determinable responsibility, and clearly sustain the action of the Board in adopting the revised rules looking toward this end, and the centralizing of all purchases in one department.

The clerk who took over the work formerly handled by the superintendent of supplies was without any previous experience in purchasing except such as was gained in a clerical capacity. The change in the purchasing office occurred at a time of the year when the estimates, specifications, and contracts for the succeeding year for all educational supplies were under consideration. This is the one period of the year when the purchasing division is busiest and when experience and knowledge of specifications and market conditions is most valuable.

The Board was fortunate in having a clerk who, despite her unfamiliarity with the work and the great amount of labor involved, managed to fill most of the pressing demands for supplies, although the delay in getting out the supply schedules for bids resulted in corresponding delays and other inconveniences in securing many of the articles requested. These are discussed in detail below under the section "Methods and Procedure."

There should be only one purchasing department and one purchasing agent or officer. All supplies, etc., now purchased by the several persons or departments outlined above, with the exception of those perishable supplies bought in small quantities as needed by lunch rooms and domestic science classes, should be purchased by or through this central purchasing department.

The immediate result of centralizing all purchases under one responsible head, with the exceptions noted, would be to relieve those persons now so engaged for other work in their respective departments. The final result would be to stand-

ardize the whole system of purchasing, with economy in cost and effort of doing the work, give uniformity to forms and records of purchase, and possible lower prices for commodities. With respect to perishable supplies purchased in small quantities as needed for high school lunch rooms and domestic science classes, it is not expedient to change the present system of securing those supplies.

## **2. Methods and Procedure**

### **Annual Estimates, Educational and General Supplies**

Annual estimates for the succeeding year's supply are made by all schools and departments. Estimates for departments and for high school are required to be submitted to the supply clerk on or before May 1st each year. Estimates for grade school supplies are required to be submitted by principals direct to the supply clerk by June 1st.

Supervisors of departments, with the exception of the supervisor of drawing, prepare their estimates from data submitted to them by department teachers. Drawing teachers submit their requests to their respective principals. Each principal summarizes the request on one form and forwards this direct to the supply clerk. The latter turns the requests over to the supervisor of drawing, who inspects them, approves or disapproves each request and returns them to the supply clerk.

The withholding of annual estimates of supplies until May 1, and June 1, respectively each year is too late for the proper consideration and assembling of all supplies requested. The preparation of specifications and delays incident to giving dealers necessary time to make their bids, etc., require that all estimates should be in the supply clerk's hands by February at the latest.

This will permit of sufficient time to prepare all supply schedules and to get them to the dealers, allowing also for the awarding of bids and issuing of orders in time for the manufacturers to provide for filling the request during the summer months. The delays in getting in the estimates last year were responsible in a measure for the delays in delivery of many of the supply items till after the schools had opened in the fall.

### **Bid or Specification Sheets and Awarding of Bids**

All school and general supplies purchased "costing more than \$20.00 (Sec. 4, Rule 111 of old rules of Board) must be purchased on competitive bids." When the annual esti-

mates for supplies have been assembled by the supply clerk, typewritten "specification" sheets containing the items of supplies required by the Board of Education are sent around to the various manufacturers or merchants in the city as a request for quotations. The date the bids are to be opened is stated in the specification sheets.

The practice of the former committees on supplies was to open all bids in the presence of the dealers or person who had submitted quotations, and to make the awards at the same time. For this purpose, lists were prepared in advance, and as bids were opened the quotations would be listed. When all bids had been tabulated, samples, if any, would be inspected and the lowest responsible dealer awarded the bid on each item. The superintendent of schools and the secretary, who, since the adoption of the new rules in January, 1916, have been making all awards of supplies purchased on formal bids, open bids in the presence of bidders but the awards are made at a later time.

The tabulation of all bids was done on common blank sheets of paper ruled by hand for each specification sheet, with the names of articles typewritten down the left-hand margin of the tabulation sheets.

The several changes in membership of the committee on supplies and the inconvenience of waiting for the committee to set dates for the opening of bids, resulted in the purchase of many items of supplies without formal bids and awards, the total of which would have exceeded the \$20.00 limit established in the rules. It was not always convenient for the committee members to set frequent dates for the opening of bids. The procedure of getting bids was so formal that it interfered with the prompt despatch of business and caused delay in getting supplies.

The supplies purchased without the formal opening and awarding of bids were always purchased, however, after inquiries for prices had been made to several different dealers by phone or letter. The practice of awarding bids at the time bids were opened would seem to support the impression that the committee desired to get through with its work in the shortest space of time.

It is impossible to give mature and proper consideration to the selection of goods, and the determination of which article is the best and cheapest for the service expected of it, where awards are made coincident with the opening of bids. Many articles of supplies purchased by the Board

would require expert advice or chemical analysis before the question of quality and price could be decided.

To illustrate this point, reference is made to the toilet paper purchased last year for the current year. For several years previous to the current year, a certain brand of paper had been purchased by the Board, with leased fixtures. The price paid for this brand in 1914-15 was \$4.25 per case of 400 sheets to a package, 100 packages to a case. The fixtures supplied protected the paper and prevented unnecessary waste. Three hundred and forty dollars' worth of this paper covered a year's supply. Last year a new brand was selected costing \$9.00 per case with 3,000 sheets to a roll, 100 rolls to a case. The same quantity of cases (80) was purchased in both years.

One firm received the award for the paper and another firm received the award for the fixtures. The latter firm objected to accepting the award for fixtures without the paper also. The committee insisted, however, and the firm supplied fixtures at a total cost of \$150.00. The rolls do not fit the fixtures. Before a roll can be used on one of these fixtures an inch or so of thickness must be taken off. The quality, also, is unfit for use. Although a 3,000-sheet roll should last at least seven times as long as a 400-sheet package, yet the quality and the present fixtures appear to more than offset the smaller package, considering the quantity of the rolls issued to schools this year. A little closer study of the whole phase of this situation might have resulted in a more satisfactory purchase of toilet paper.

The awarding of bids, also, by items, should be done with more consideration than has been customarily given to the size of the order a dealer may be called upon to deliver. The manual training department schedule for hardware supplies last year contained many items costing only a dollar or two and less, yet the committee awarded this schedule by items. The letter of transmittal accompanying the request to dealers for bids stated that each request for bids "will constitute an award." Two prominent dealers awarded some small items on the schedule refused to make delivery or to do any more business with the Board, quoting the letter of transmittal quoted above.

In the case of the manual training department schedule for paints, etc., the committee reversed the procedure followed on the hardware schedule and awarded the paint schedule

to the lowest bidder in the aggregate. This award, also, caused protest on the part of the unsuccessful bidders on paints, etc.

It is difficult to maintain proper working relations with firms and obtain the best results where there is not a definite policy and procedure with respect to all transactions involved. All supplies which are purchased in small quantities and which experience indicates could best be purchased by awarding in the aggregate, should be so purchased. For all supplies purchased or price agreements entered into there should be a standard form of specifications covering those conditions which regulate the actions of the successful bidder in fulfilling his contract and which at the same time inform him of the conditions the Board is obligated to fulfill. No such definite contract specifications are now in use.

Bids should be awarded in all cases shortly after the opening of bids but only with such haste as will permit of careful consideration and test of the samples of supplies submitted.

#### Specifications for Educational and General Supplies

The question of specifications for supplies has not received very much consideration. Brands and trademarks are usually referred to in specifications and where no brands are mentioned the article itself merely is referred to, and dealers are requested to submit samples of the article on which they are bidding. At times specifications call for a quality of article which is not usually used by the Board and which it does not select when offered.

For example, the specifications for floor brushes call for "pure bristle." The prices quoted last year by five different dealers on a 20-inch floor brush with "pure bristles" ranged from \$28 to \$42 per dozen. The award was made to a dealer who quoted on "mixed bristle" at \$38.50 per dozen. There have been some complaints from janitors on the quality of the brush furnished on this award, but the dealer states that the quality of the brush in question is equal to the price paid for it by the Board.

The schools have been using annually approximately \$1,200 worth of different-sized floor brushes. The use of proper specifications and a thorough working test of bristle brushes might result in considerable saving on this item. The excessive number of brushes used in some of the schools has been referred to previously herein. The quality of brushes purchased may be responsible for this excess.

The absence of detailed specification stating exactly the kind of article wanted, prepared in terms and specifications known and standard in the trade or markets, is a serious inconvenience to dealers and an obstacle to successful and economical buying. Dealers should under no circumstances be required to guess what the Board wants when they read a supply schedule issued by the Board. There are many varieties, sizes, makes, etc., of almost every article in common use in the schools. Any vagueness or uncertainties about the thing wanted will discourage free competition and result in higher prices or inferior goods.

There is more clerical labor expended under the present system of preparing specification blanks and tabulation sheets than would be necessary if supplies were standardized and printed schedules and specifications were used. Each year in the case of annual estimates, and, during the year, as supplies are purchased on formal bids, all the articles of supplies and specifications have to be typewritten on as many specification sheets as are sent out to different dealers for bids, and again typewritten on blanks used for tabulating the bids.

The present system is unsatisfactory also, in that the same supplies may be found on several different schedules, instead of all supplies of the same class being found on one schedule or set of forms. Further, the present form of specification blanks are incomplete in the printed information contained thereon concerning contract conditions.

A detailed study should be made of all the supplies purchased by the Board. Detailed and accurate specifications should be prepared for every article purchased. Trade names and brands should be eliminated in all cases of articles which admit of accurate description. All supplies used currently in the schools should be standardized and printed on standard uniform schedules arranged in such a way that these schedules may be submitted to dealers for bids at such times during each year, and covering such periods, as offer the best opportunity of securing supplies at the best prices.

The use of such printed schedules would to a considerable extent reduce the work and cost now incident to securing each year's supplies. A further advantage would be the grouping of all supplies of the same kind as nearly as possible on one schedule or set of schedules. Under this system, whenever new prices are required, it would be neces-

sary merely to mail the schedules to the dealers and have the price agreements cover stated periods of time, during which supplies might be purchased.

### Inspection Service

There is no inspection service. The quality, quantity, etc., of goods delivered to the schools or departments is determined by the person who receives the goods or the consignee thereof. It is a very poor business policy to expend considerable time and effort of officers and employees preparing specifications, selecting samples, etc., and then neglect to see that the goods are of the quality and kind the Board contracted for.

According to the old rules of the Board in effect up to January 13, 1916, the secretary was required to certify to the "correctness as to quality and quantity" of all deliveries of educational and general supplies. This was an impossible thing for the secretary to do in connection with his regular secretarial work, as supplies were delivered to many different points in the school system. The only effective way to certify to the correctness of deliveries is to have some competent person assigned to this duty and responsible direct to the business management.

The practical utility and value of an efficient purchasing and inspection service is no more clearly demonstrated than in the purchase of those articles of supplies which require analysis or chemical test to ascertain their quality and to determine which article of a class is the most economical to buy.

To illustrate this point, reference is here made to the recent experience of a school board in a large northwestern city in the purchase of liquid soap for school lavatories. Formerly chemical analyses were made only of coal purchases. With the beginning of a new administration, close attention was given to the quality of many other articles of supplies besides coal. Among these, liquid soap was selected for a chemical test. The result of the analysis is shown in the following tabular statements:



RESULT OF ANALYSIS OF SAMPLES OF LIQUID SOAP

Sample Number	Color of Sample	Clearness	Perfume Present	Total Solids, Grm. per 100 cc.	Total Solids, Lbs. per Gal.	Free Alkali as Pot. Carb. Grm. per 100 cc.	Free Acid as Oleic. Grm. per 100 cc.	Quoted Price per Gal.	Cost of Soap per Lb.
1	Green . . . . .	Fairly clear..	Yes . . . . .	17.23	1.48	. . .	.496	\$ .50	\$ .33
2	Colorless ..	Mod. turbid..	Yes . . . . .	27.27	2.12	.046	. . .	.99	.467
3	Colorless ..	Turbid . . . . .	No . . . . .	11.79	1.01	.057	. . .	.40	.39
4	Sl. yellow..	Fairly clear..	Yes . . . . .	25.62	2.34	.057	. . .	.80	.34
5	Colorless ..	Turbid . . . . .	No . . . . .	4.52	.39	.016	. . .	.39	1.00
6	Yellow . . . .	Clear . . . . .	Yes . . . . .	30.25	2.59	.112	. . .	.69	.266
7	Colorless ..	Turbid . . . . .	No . . . . .	34.04	2.92	.068	. . .	.49	.167
8	Colorless ..	Mod. turbid..	No . . . . .	26.67	2.29	.090	. . .	.50	.214
9	Yellow . . . .	Mod. clear..	Yes . . . . .	10.92	.94	. . .	.598	.65	.69
10	Colorless ..	Mod. turbid..	No . . . . .	26.32	2.26	.035	. . .	.48	.211
11	Colorless ..	Turbid . . . . .	Yes . . . . .	9.07	.77	. . .	.203	.65	.844
12	Colorless ..	Mod. clear..	No . . . . .	14.86	.90	.090	. . .	.36	.40
13	Colorless ..	Mod. clear..	Slightly . . . .	28.94	2.48	.098	. . .	.60	.241
14	Colorless ..	Mod. clear..	No . . . . .	21.08	1.80	.117	. . .	.50	.279

SUMMARY OF ANALYSIS OF LIQUID SOAP

	Sample Number	Price Quoted per Gal.	Cost of Soap per Lb. per Analysis	If 800 Gals. Purchased per Year, Would Cost	Actual Lbs. of Soap Contained in 800 Gals.
Highest price quoted for liquid soap . . . . .	2	\$ .99	\$ .467	\$792	1696
Lowest price quoted for liquid soap . . . . .	12	.36	.40	288	720
Highest price solid soap per analysis . . . . .	5	.39	1.00	312	312
Lowest price solid soap per analysis . . . . .	*7	.49	.167*	892	2847

\*Indicates the soap for which contract was awarded.

The variation in the actual quantity of soap contained in the samples submitted with bids is clearly indicated in the foregoing tables. It will be seen that the price per gallon bore little relation to the quantity of soap for which the School Board would be paying. The summary statement shows the extremes in the samples tested, and in the sample which would furnish the greatest amount of soap for the least expenditure of money.

All supplies purchased should be inspected by some person assigned to that duty. All articles which require chemical analysis or test to determine whether they are in accordance with specifications should be so tested. To facilitate this inspection service, all supplies which may with convenience be delivered at the central storehouse should be delivered to that point.

There should also be a sample room in which all standard samples of supplies used by the school system could be on exhibit for the convenience of bidders and the inspector

of supplies. The report of the inspector should establish the quality, quantity and other particulars concerning each delivery of supplies and the correctness of invoices representing purchases of supplies.

### Purchase Orders

All purchase orders are issued with reasonable despatch after awards of bids have been made, in the case of formal bids, or after prices have been obtained from dealers in the absence of formal bids and awards. One thousand four hundred and sixty-seven purchase orders were issued during the present fiscal year (from July 1, 1915, to April 29, 1916), for educational and general supplies alone. The average number of items per order for that period was  $3\frac{1}{2}$ .

A number of these orders were occasioned by the inexperience of the supply clerk when she first assumed the duties of purchasing supplies. To prevent purchasing too much of any article or getting unsatisfactory supplies, the orders usually issued for a year's supply were issued last year for a partial supply only, and at different times, until the supply clerk was familiar with conditions. Due to the division in the purchasing function, as between different departments, some orders were issued for supplies in such quantities as must make the Board look ridiculous to merchants. The two examples submitted below will illustrate this point:

a. Order No. 916. 12/23/15.

4 doz. screws (different sizes),  
3 screen door hooks and eyes,  
2 lbs. nails.

Total value of order, \$0.35.

b. Order No. 1225. 2/4/16.

1 gross  $1\frac{1}{2}$ "x10 F. H. bright screws.

Total value of order, \$0.21.

The supplies ordered, as outlined above, were requested by two different schools for some minor repairs to be made for the janitors. Although these articles were purchased as indicated, the manual training department storeroom had a number of gross boxes of the  $1\frac{1}{2}$ "x10 screws in stock, purchased at 12c per gross. With a centralized purchasing system and control over all supplies wherever stored, the issuing of such orders as referred to above would be unnecessary.

The form of purchase order in use could be improved in size and in the printed matter contained thereon. With the establishment of an inspection service as suggested in this report, an extra quintuplicate copy of purchase orders would be necessary for the inspector's use. The present form is  $8\frac{1}{4} \times 5\frac{1}{2}$ ". A standard size of  $8\frac{1}{2} \times 11$ " would be more convenient for filing purposes and would permit of the printing thereon of the necessary certifications relating to sufficiency of funds to pay an order, certificates of agents receiving goods, etc.

The chairman of the committee on supplies and the secretary formerly signed all purchase orders. The superintendent of schools and the secretary now perform this duty. It should be necessary only for the purchasing officer, with the proper safeguards and restrictions, to sign purchase orders before they are issued to dealers or merchants. This would expedite the issuing of orders and reduce the labor of the superintendent and secretary in this connection.

#### Requisitions on the Storehouse

Schools may requisition supplies at any time, although they have been instructed to confine requests for supplies to once in every two weeks. The school district is divided into zones to facilitate delivery of supplies from storehouse, a delivery date being set for the schools in each zone. All requisitions (original only) are sent by the schools direct to the supply clerk. The latter assembles all requisitions and takes them to the storehouse to determine which articles can be delivered from stock and which articles have to be purchased.

Supplies which have to be purchased are purchased in accordance with the procedure outlined in the foregoing pages. For supplies which are in storehouse, the supply clerk makes out a requisition on the storekeeper, copying the details from the school requisitions. The supply clerk writes a separate requisition in triplicate on the storekeeper for each school requesting supplies.

All three copies of supply clerk's requisition are sent to the storehouse. The storekeeper keeps one copy and sends the other two copies with the goods to the respective schools. One of these two copies is signed by the receiver of the stores and returned to the storehouse by the expressman and filed there, and the other is kept in the school.

In the case of the annual estimates for supplies, the supply

clerk is required to issue requisitions on the storekeeper for the delivery to schools of all those supplies delivered in the summer months from the storehouse. These requisitions advise the storekeeper of what supplies have been let on annual contract and also the schools to which the supplies are to be distributed when deliveries have been made to the storehouse by contractors.

The whole procedure of issuing supplies from the storehouse is very cumbersome. The supply clerk has no means of knowing what is in stock in the storehouse unless she visits the storehouse personally or spends hours telephoning. The storehouse is nearly a mile away from the supply clerk's office. The supply clerk is even unaware, under the present system, after a requisition has been sent to the storehouse by the supply department, whether it has been filled or not. Requisitions in the past have been mislaid in the storehouse or in the supply department and not discovered until the school concerned made inquiries about its request.

The rewriting of school requisitions and the visits to the storehouse are a waste of time. The procedure should be reversed. All requisitions should go first to the storehouse. Those supplies which are in stock should be delivered by the storekeeper without reference to the supply clerk. For those supplies which require purchasing, the storekeeper should make out a form of purchase requisition on the supply clerk.

The form of requisition issued by schools for supplies should be issued in quadruplicate so that one copy could serve, also, as a delivery slip for the receipt of goods, and another left at the school with the goods as a record of a delivery. By the use of a printed code on requisitions, the person requesting supplies could be informed, by a check mark against the code, of the status of such supplies requested as were not delivered for the reason stated in the code.

The supplies issued during the summer months, also, should be issued on requisitions made out by the schools and forwarded direct to the storehouse before the close of schools in June of each year.

With some such system and procedure of requisitioning supplies, as outlined above, the purchasing division would be free to devote its whole time to that function, and delays which have occurred under the present system in getting supplies to schools would be eliminated.

### Records and Files (Education and General Supplies)

The supply department has no card or other record showing every article purchased, the prices paid for each, from whom purchased, etc. There is no such record in the Board of Education. A record of this kind is indispensable in a purchasing department as a quick reference in the matter of prices, etc., and also as a guide in the preparation of schedules of supplies. A card record such as that suggested above should be started at once.

The department has a card record showing the firms from whom the Board has purchased supplies, with order numbers and amounts of invoices. The keeping of this record would be unnecessary in the supply department if the card record of supplies were established.

There is in use, also, a register of purchase orders. This is a necessary register as giving a chronological and numerical record of all purchase orders issued, but the distribution side of the register is unnecessary, as now used. All purchase orders issued are entered in this register in numerical order, as to date, vendor, order number, material, rate of discount and amount of order. Later, when a voucher is paid, liquidating a purchase order, the date of payment and the amount paid are noted in columns for the purpose opposite the purchase order. The amount paid is then distributed in one or more of nine columns to the right of the purchase order liquidated.

The columns on the right hand side of the register, showing the expense or property accounts affected by each purchase order, were used at one time in connection with the budget allotments for the different accounts, and also to show the amounts of the several classes of supplies purchased. This budget relationship to the accounts in the order register no longer exists, however, and the classes of supplies purchased are shown in the voucher register, so that there is no need of these columns in the order register. The elimination of the columns will save considerable unnecessary clerical labor in the purchasing division.

### Repair Material and Supplies

As stated previously in the section dealing with the organization performing the purchasing function, the supervising engineer personally purchases all supplies needed in his department for repairs or improvements. The method and procedure of purchasing these supplies is separate and distinct from all that has been said regarding the methods

and procedure of purchasing educational and general supplies.

The same criticisms, however, made against the systems of purchasing educational and general supplies, may be made against the systems of purchasing repair material and supplies. The supervising engineer purchases most of his supplies on competitive bids secured by means of the telephone or by letter. No standard forms of documents are used for this purpose and no formal contracts are entered into. The supervising engineer makes the awards, although prior to the present year, such matters were usually approved by the action of the chairman of the committee on buildings and grounds in signing all purchase orders before the supplies were bought.

Nearly everything purchased is purchased only as a repair or improvement job is begun and material or supplies are needed, with the exception of coal and paints and varnish.

This system of purchasing supplies naturally results in a constant repetition of the work of getting prices and issuing orders for many things which are in frequent demand and which might conveniently be purchased in sufficient quantities to keep a stock always on hand in the storehouse.

As an illustration in point, dozens of purchase orders are issued almost every month for various sizes of lights of glass.

The repairing of window lights in schools is one of the most frequent duties of the repair department, yet an order will be issued for each light of glass as the repair becomes necessary, unless several different schools need new glass at the same time, in which case one order may cover the several schools.

The repetition of purchase orders has resulted also in a larger volume of invoices with a corresponding increase in the work of checking and approving invoices, distributing the charges to schools for each invoice, making out vouchers, and, in fact, all the work incident to the registering and paying of claims. A large part of this work devolving upon the supervising engineer, invoices have not always been settled promptly, because the engineer is the only one who can verify prices and approve the bills, etc.

The form of purchase order used is different from those used in the purchase of educational and general supplies. With two departments each purchasing its own supplies, many similar articles are bought by each which could more

profitably be secured on one order for both departments. It needs little argument to demonstrate the advantages of a few large orders to many small ones. Purchasing from hand to mouth, so to speak, the department is unable to utilize these advantages. What the financial loss has been on this system of purchasing supplies can only be conjectured.

As suggested under the section on organization, all the work mentioned above incident to the purchase of repair material, etc., for the buildings and grounds department, should be centered in one department. With a central purchasing department the buildings and grounds department would secure all its supplies on requisition through the central storehouse. All supplies used currently would be kept in stock and issued and charged to jobs only when issued from stock, except in the case of special material delivered direct to a job.



### III

## STORAGE AND DISTRIBUTION OF SUPPLIES

### 1. Organization

Supplies for general distribution to schools are stored in the following places:

- a. General storehouse,
  - (1) Educational and general supplies,
  - (2) Miscellaneous repair material left over from jobs, and paint supplies.
- b. Evans School,  
Manual training department hardware, varnish, and other shop supplies, exclusive of lumber, which is delivered direct to schools by vendors.
- c. East Side High School,  
Sewing department supplies.

In the general storehouse, the storekeeper and one clerk receive, store, and issue the educational and general supplies that are delivered to the storehouse. Each of the five foremen in the repair department has charge of certain of the surplus stocks of repair supplies kept in the storehouse. The receipt, care and issue of manual training department supplies is done by the supervisor of that department, with the assistance of a manual training department teacher in the first week of school each September. A clerk to the supervisor of sewing receives, cares for, and issues all sewing department supplies.

The tendency within departments to handle the purchase, storage and distribution of supplies, each department for itself, always manifests itself wherever the central organization is inefficient or fails to fulfill its obligations to the divisions or units, making up the organization. This decentralization has resulted in the establishment of separate organizations engaged wholly or part time in the recording and handling of supplies in each department, whereas one organization, efficiently conducted, could perform the same service at less cost.

### 2. Methods and Procedure

Receiving Supplies. Educational and General

The storekeeper receives a copy of all purchase orders for educational and general supplies delivered to the store-

house. Copies of orders, pending delivery of goods, are kept in a folder for the purpose, with an index to facilitate reference to orders awaiting delivery of goods. The storekeeper or his clerk receive all educational and general supplies, checking off each delivery against the copy of purchase order.

Complete delivery of goods to the storehouse is noted in ink in the stores ledger, and the purchase order is then placed in a permanent file. Partial deliveries of goods are noted in the stores ledger in lead pencil in memorandum form only, and the purchase order remains in the temporary folder.

Owing to delays in the purchasing division in completing its contracts with manufacturers and merchants for the delivery of supplies included in the annual estimates, many lots of these supplies are not received in the storehouse until late in the summer and frequently not until after schools have opened in September. These late deliveries increase the work of the storekeeper in checking off and registering all supplies received, coming as they do at a time of the year when sufficient quantities of all school supplies have to be in the schools before they open in September.

The probability of confusion and delay in properly checking off and registering supplies received at the storehouse is increased, also, in the absence of a "platform" record or "goods received sheet" on which to enter a record of deliveries immediately at the time goods are received from vendors. Not all vendors deliver delivery slips with their goods. Thus it requires unusual care on the part of the storekeeper later in checking off on purchase orders all goods received and verifying deliveries.

Further, the rush and labor of receiving and issuing supplies in the summer months makes it difficult to give the proper inspection to all supplies as to quality and other specifications. The indexing of all purchase orders is, also, an unnecessary hindrance to the prompt and efficient handling of supplies. If all purchase orders were filed alphabetically by firm names in a temporary filing case, the storekeeper could promptly pull out each order corresponding to the firm making deliveries as the goods were received.

### Issuing Supplies

Supplies are usually issued from the storehouse in accordance with a zone schedule into which the school district is di-

vided for convenience in making deliveries. Once every two weeks schools may make requisition for supplies from the storehouse. In special or emergency cases, however, a school may send in a requisition as supplies are needed.

The supply clerk in the purchasing department receives all school requisitions, and in accordance with the procedure in that department, as outlined previously, issues requisitions on the storekeeper for such educational and general supplies as are carried in the general storehouse. The storekeeper fills all requisitions, as soon as they are received from the supply clerk, in accordance with the scheduled delivery dates for each zone. Janitors usually receipt for all goods delivered to schools. A copy of each requisition from the supply clerk is left at a school with the goods delivered, and a receipted copy is returned to the storekeeper and filed in his office.

As commented on in connection with the supply clerk's relations to the general storehouse, the procedure of issuing supplies is unnecessarily complicated and reverses the usual procedure of requisitioning supplies from a storehouse. If the purchasing department and the storehouse were in the same building the present system might be workable, but under no circumstances should it be necessary to rewrite school requisitions on the storehouse before the supplies may be issued.

Standards as to kinds and quantity of certain educational supplies that may be used per pupil in certain grades have been established for several years, but these standards have not been followed in the issuing of supplies from the storehouse or in the use of supplies in the classrooms. Neither the supply clerk in the purchasing department nor the storekeeper have attempted to regulate the issue of supplies in accordance with the standards, and a supervisor of one of the departments with such standards stated that, until order and system were established in all school store-rooms and teachers restricted in the free access to store-rooms, standards were of no value.

The adoption of standards as a guidance to the storekeeper, principals, teachers and others concerned is a very desirable thing in controlling the use of supplies and preventing waste or extravagance. The purpose of standards of consumption, however, is not to practice economy at the sacrifice of necessary material for classroom purposes. Neither is it planned to make bookkeepers out of principals and teachers. It is intended, rather, by the use of standards

of quantity and kinds of supplies that may be used for stated work, to set certain limits in such matters which experience has demonstrated to be adequate and necessary for all ordinary classroom work.

The application to classrooms of standards of consumption of supplies is merely an extension to the individual units of a school system of the principles embodied in scientific management and control. No one will contend that such principles cannot be practiced with profit in school management.

#### Stores Ledger and Reports of Goods Received and Issued

Owing to the volume of work placed upon the storekeeper and his clerk in the months of July, August, and September in receiving yearly quantities of supplies, checking off deliveries, filling requisitions for schools, making out reports of the previous year's issue of supplies, and of inventories, etc., the work of posting to the stores ledger all goods received and issued gets several months behind and is not caught up with until about January of each year. After that month all entries are kept currently up to date.

Under the present system of accounting for and reporting supplies received and issued, the stagnation in the work of entering up the storehouse records each summer does not materially affect the records in the central accounting division in the secretary's office for the reason that the storekeeper reports only once a year all supplies issued to schools, and he makes no reports of goods received other than such as is contained in the approval of an invoice for goods delivered to the storehouse.

This system of reporting, however, does not fit in with modern accounting or efficient storehouse procedure. It keeps the storehouse records and the general accounting records relating to stores and expense accounts at variance with respect to all stores transactions. Many lots of goods may be received at and issued from the storehouse weeks before any record of the deliveries are entered in the general accounting books.

Further, the labor involved in making an annual report, by schools, of the cost of all supplies issued from the storehouse during a previous year, is many times what it would be if reports of goods issued were made daily or monthly. The storekeeper estimates that it takes about six or seven weeks to make a complete report of the cost of supplies delivered to schools during a previous year. This work,

in addition, falls on the storekeeper and his clerk at a time of the year when they should be free to give their whole attention to the supplies beginning to come in to the storehouse on the annual supply contracts, and to the issuing of these supplies to schools.

The storekeeper complains that the present form of supply clerk's requisition and the stores ledger are not designed to facilitate the work of posting currently all issues of supplies, and of making out annual reports of supplies issued to schools and on hand. The requisition does not contain any columns for entering the unit prices of goods issued and the total cost of each requisition.

The requisitions are posted to the stores ledger by quantities only. The stores ledger is loose-leaf and contains a page for each article of supplies kept in the storehouse (exclusive of second-hand material, a record of which is in another book), with a list of the schools printed down the left hand margin of each page.

The stores ledger combines the principles of a "permanent" inventory record and of a consumption record by schools. The form is ruled to show, for each article of supplies, the following columnar information:

- a. Inventory at beginning of year
- b. Requisition No. and Quantity Issued (6 columns)
- c. Total Distribution (quantity)
- d. Cost
- e. Total Distribution and Inventory
- f. New Inventory
- g. Consumed, Condemned, or Lost
- h. Date of Purchase Order
- i. Order Number
- j. Voucher Number
- k. From Whom Purchased
- l. Amount
- m. Price
- n. Quantity Purchased
- o. Quantity Distributed
- p. Quantity Balance
- q. Unit
- r. Value of Balance

It will be clear from this list of columnar headings in the stores ledger that in a form of this size (18"x23") there is not only considerable clerical work involved to determine totals of goods issued and inventory balance for each of

several thousand articles, but that there is an average of from 40 to 50 per cent of each ledger page wasted. Combining in one register a record of stores and a record of points (schools) to which stores have been distributed makes it extra hard to sum the total issues of any article at any given time.

Each one of the six "quantity issued" columns, if it contains any entries, must be added completely each time it is desired to find the balance in stock, because no column is complete until every school has had at least one delivery of goods entered in a column. The waste in paper is due to the design of the form in providing 18"x9" of every page for entering a record of goods received. Most articles delivered to the storehouse are delivered only once or twice a year, thus requiring only that number of entries in the stores ledger.

There is an apparent advantage in combining a stores ledger and a distribution record in one form. The one entry of an issue of supplies registers at the same time the school or department which received the supplies. The advantage is more apparent than real, however. A stores ledger and a distribution record are designed primarily for two different purposes. A stores ledger is intended to show promptly and accurately the quantity of any given supplies in storehouse at any given time. The question as to whom the supplies were issued is of no importance in this connection unless error or shortage is found in the inventory.

A distribution record, such as that for a school system, should be designed to show the quantity of supplies issued to each school or department, together with the inventory of each article at the beginning and close of a year. The record should be used as a basis for controlling the issue of supplies to schools. A stores ledger and distribution record combined in one form interferes with the work of a stores ledger clerk and with the keeping of effective control over the quantity of supplies that may be issued to a school.

If the two records were separate, there would be a certain amount of duplicate entries, but at least one clerk could be working on the stores ledger keeping it up to date, and another clerk could at the same time be entering up the distribution record and referring to it in connection with the control over quantities of supplies issued to schools, or

be engaged in making such reports of issues of supplies as may be desired for administrative purposes.

### Inventory of Supplies in Storehouse

An annual inventory of educational and general supplies in the general storehouse at the close of each fiscal year, is prepared by the storekeeper. Any differences between the actual quantity on hand and the quantity that should be on hand, according to the stores ledger, are ignored, after a note of the difference is made on the storekeeper's copy of inventory. The actual balance on hand is the quantity set up as the inventory at the beginning of the succeeding fiscal year. The annual inventory sheets are sent to the secretary's office. The storekeeper keeps a copy for his files.

### Second-Hand Supplies

Educational and general supplies returned to the storehouse in good and serviceable condition are registered, as to quantity only, in a register of second-hand material and placed in stock for reissue to schools. If issued to a school, such supplies are not recorded in any cost records for the reason that no credit is given to any school or department for returning second-hand supplies.

If an article of supplies is returned new, however, from some delivery made to a school in the current fiscal year, credit is given to the school at once and the book placed in stock at its full value. If an article is returned new by a school from some delivery made in a previous fiscal year the article would be placed in stock, but no credit would be given to the school that returned the article. To determine the value at which the returned article shall be again issued to a school, the total value of the stock of the same articles in the storehouse is divided into the total quantity on hand, including the new article returned. The quotient is a new unit price for each article of the stock increased by the returned article.

The procedure is cumbersome and inaccurate, and unfair to the school which returns any supplies. While schools return very few articles of supplies in new condition, as stated by the storekeeper, yet the procedure outlined above is the one that is followed in such cases.

The procedure is faulty, also, from an administrative standpoint in that no report to the accounting department is made of supplies returned to the storehouse.



### Storage Facilities

Educational and general supplies are stored on the third floor of the general storehouse. A hand-power elevator is used to convey goods to or from this floor. The space available for storing educational and general supplies on the third floor is adequate for present needs, but all such supplies should be stored on the first and second floors.

The first, or ground floor, is occupied largely for storage of school desks, for janitor's quarters, and storage of miscellaneous plumbers' and steamfitters' supplies. The second floor is used for the carpenters' and painters' shops and the storage of school desks needing repairs or already completed, with a small section partitioned off for the storage of electrical supplies.

A complete readjustment of space occupied in the storehouse building seems very necessary. The supplies which are subject to the most frequent movement in and out of the storehouse, should be located on those floors which will necessitate the least hauling or carting from their permanent location in the building to the street, or vice versa. A hand-power elevator is an unwieldy apparatus to have to depend upon for raising or lowering supplies and desks from floor to floor. There should be a motor-power elevator for such purpose, and work shops should be on the third floor.

The present arrangement of educational and general supplies on the third floor is poor and wasteful of space. Not all supplies of the same kind are assembled and stored in one place. There is considerable floor space occupied by large boxes, etc., which could conveniently be utilized for other purposes. Empty boxes and other containers should not occupy space needed for a more orderly arrangement of supplies. No bin cards or stock tickets are utilized or attached to each lot of goods, identifying supplies, and showing the quantities of each lot that should be in a bin or on hand, without having to refer to the stores ledger for this purpose.

### Miscellaneous Repair Material. General Storehouse

As stated previously in connection with the procedure in the buildings and grounds department and in the purchasing of supplies, the only repair material carried in stock, with the exception of paints, varnish, etc., and some recent purchases of electrical supplies to be used in connection with improvement and alteration work now under way in cer-

tain schools, is made up of such surplus material as accumulates after a job has been completed in a school and of second-hand material. These supplies are stored in the general storehouse under the charge and direction of the respective repair foremen.

No store records are kept of such supplies and no reports made of quantities used, with the exception of the paint shop supplies and the recent purchases of electrical supplies. The paint shop supplies, however, are charged to a shop account when purchased and no inventories are made of balances on hand at any time. The procedure of handling repair material is very loose and indefensible, and permits of no adequate control over such material. The value of the surplus new stock and the second-hand repair material on hand at a recent date was estimated by the building and grounds department to be approximately \$1,200.

#### Manual Training Department Supplies

Manual Training department supplies are delivered by dealers or vendors, direct to a storeroom in the Evans School. Quantities sufficient for a year's supply are delivered to the Evans School, usually in the summer months, with the exception of lumber. Lumber is delivered directly to the grade schools having manual training classes.

The supervisor personally attends to the checking, storing, and issuing of supplies to the schools, of which there are 37 with manual training classes. During the first week of the school year, a teacher assists the supervisor in making deliveries to schools of such supplies as oils, alcohol, and turpentine. For this purpose, the teacher accompanies the expressman to the schools and fills the 1/2-gallon containers in each school from 5-gallon cans, the quantity in which such supplies are purchased. He receives no extra compensation for this work. The supervisor estimates it takes about three days of his time and of the teacher's, to check all goods received and pack supplies for each school at the beginning of the school year.

Usually each manual training department class receives sufficient supplies at the beginning of each year for a year's requirements, but requests are frequently made during a year for additional supplies. Deliveries of supplies to schools are usually made by the general storehouse expressman.

The supervisor keeps a card for each school, on which card he notes each delivery of supplies to a school. The card is printed to show the items of supplies used in the manual training department classes, with columns for the inventory at the close of the previous year and for deliveries during the current year. A card record is kept, also, showing the articles purchased during the current year. In addition to the work of keeping purchasing records, stores records, inventory records, receiving and issuing supplies, etc., the supervisor is required to report to the secretary at the close of each year the cost of all supplies delivered during the year to the 27 schools with manual training department classes.

All the duties and procedure outlined above are an unnecessary and gratuitous imposition on the supervisor. The purchasing department, with the establishment of the card record of all supplies purchased, recommended elsewhere herein, would have all the data on purchases now tabulated by the supervisor on his cards. The storekeeper in the general storehouse could, without much extra effort, keep all the stock of supplies carried by the supervisor, issue the supplies, and prepare all reports and statements thereon now prepared by the supervisor.

The duplicating of any part of the functions of purchasing, and of storing and distributing goods, making reports thereon, etc., is so much time taken from the direction and supervision of the educational work of the manual training department, without any particular advantage to the Board of Education that could not be secured under an efficient administration of the purchasing department and the general storehouse.

#### Sewing Department Supplies

This class of supplies is more or less peculiar and specific to the sewing department. Under present conditions, the best results, probably, in the handling of these supplies is obtained from the present arrangement of storing and issuing this class of articles. Whether such supplies should ultimately be stored in the central storehouse with all other supplies kept in stock for general distribution, will depend largely upon the ability of the storekeeper to distinguish the supplies and apportion them as needed.

#### Delivery Service

The Board of Education has no vehicles of its own for carting or delivering supplies to or from schools. This service

is rendered by a hired expressman who practically gives his whole time to the business of the Board of Education. For summer and fall deliveries to schools, and at certain other times of the year when deliveries are large for any school, the expressman is paid 50c per hour for himself and auto-car and 25c per hour for an assistant. At other times during the year, the rate is 35c per delivery per school.

During the past five fiscal years (1910-11 to 1914-15), the payments to this expressman averaged \$1901 per annum. The storekeeper, supervising engineer, and supply clerk when asked regarding the efficiency of the present delivery service, stated that they had no complaints to make.

Considering the average annual cost of the delivery service, it does not appear that the Board of Education with its own equipment and drivers could have operated at a very much less cost for the service rendered. It should be remembered, however, that the amount of carting done in the past under the existing business methods would be only a portion of the carting that would have been necessary if the buildings and grounds material and supplies had been carried in the storehouse and issued to the schools as needed, instead of purchased from day to day and delivered by dealers to the schools.

Further, it is only with the current fiscal years that school desks have been systematically cleaned and repaired. Desks needing repairing and cleaning are carted from the schools to the repair shops and replaced with desks carted from the storehouse to the schools. If several thousand desks are cleaned each year, the cartage charges will increase also. There are deliveries of many supplies now being made direct to schools by vendors which should instead be delivered to the storehouse, inspected there, and then issued in such quantities only as current demands may require, according to the classes of supplies.

Practically all supplies for high schools are delivered by vendors direct to those schools. Most of these supplies are purchased in yearly quantities, with the exception of lumber, which is purchased twice a year owing to the limited storage space at the Manual Training High School and North Side High Trade School and shops. The Manual Training High School uses many articles of supplies used by the manual training department, by the North Side High Trade School and shops and by the buildings and grounds department. Yet all supplies for each are purchased and

delivered direct to their destination as if the schools, shops, and the department were rival organizations.

The present system of two deliveries of lumber per year to the Manual Training High School and North Side High School and Shops not only costs the Board more for buying in small quantities, but it is claimed it causes waste of material in the Manual Training High School and in the shops. It is stated, further, that if lumber were purchased in carload lots, a better selection of material could be made, and lumber which is used in cabinet or furniture work could be thoroughly air-dried before it is used. The storage of lumber, however, would involve the installation of certain mechanical equipment for sawing and surfacing work, or arrangements made whereby the North Side High Shops' machinery could be utilized for this purpose.

If a central storehouse were utilized to its proper capacity and every effort made to realize the advantages of a central purchasing department and storehouse, there would necessarily be greater need of a delivery service, but the extra cost of carting might be more than offset by the benefits obtained from purchasing in larger quantities than at present, by having one central delivery point, and by controlling the quantity and quality by proper inspection of supplies delivered to and used by schools.

With the increased delivery service that appears to be necessary in any effective plan of reorganization of the business affairs of the Board, it would be necessary, probably, for the Board to own its own delivery equipment and employ its own drivers. It is impossible to make any comparison between the cost of a delivery service owned by the Board and a hired service. The nature and volume of the service rendered, the kinds of equipment used, the carefulness of drivers and chauffeurs in handling their vehicles, the salary paid drivers, all these factors have a bearing on the cost of a delivery service owned by the Board. A hired delivery service at fixed rates per package or load involves careful supervision of the service, and checking of bills rendered to prevent excess charges. If an hour rate is paid, the Board must depend largely on the honesty and efficiency of the expressman.

Regardless of the rate of payment, the rate is presumed to cover repairs and replacement of equipment. It may be taken for granted that a privately owned automobile will receive more care and attention with the owner driving than it would receive if owned by the Board and driven

by the ordinary driver. Repairs and replacement charges would, therefore, probably be less for a private delivery service than they would be if the service were owned by the Board of Education.

#### Suggested Charges in Storing and Distributing Supplies.

From the considerations outlined in the foregoing concerning the storing and distributing of supplies, it will be apparent that there is need of a reorganization of this service and of the methods and procedure. It is, therefore, suggested that the following changes be adopted:

- a. That the responsibility and accountability for the receipt, storage, and issue of supplies, for general distribution to schools or departments, should be centered in one department, or division, and under one head, with the exception of sewing supplies, until the storehouse is competent to handle such supplies.
- b. That all manual training department supplies now stored in the Evans School should be stored in the general storehouse and issued from that point.
- c. That all repair material and supplies in the storehouse under the custody and direction of repair foremen should be placed in the custody and control of the general storekeeper.
- d. That the following records should be installed in the storekeeper's office:
  1. Platform records of goods received.
  2. Daily reports to central accounting division of goods received and of goods issued.
  3. Daily reports to central accounting division of goods returned to storehouse.
  4. Bin cards.
  5. Stores ledger (to supersede the present form).
  6. Stores distribution record—by schools and departments.
- e. That, wherever possible, all deliveries of supplies should be made to the general storehouse instead of direct to schools.
- f. That standards should be established as to quantities and amounts of supplies that schools, grades, departments, etc., may receive and use for stated purposes or periods of time, these standards to be determined only after careful study of the needs of each school,

grade, department, etc. Such standards, when established, should be the basis on which supplies should be issued from the general storehouse.

- g. That all schools, departments, etc., should send requisitions direct to the general storehouse for all necessary supplies. Supplies not carried in stock should be requested from the supply clerk by the storekeeper.
- h. That all supplies carried in the general storehouse should be located on the first and second floors of the general storehouse, and assembled in such manner as will establish a definite place for each class of supplies, and facilitate the efficient storing and issuing of supplies.
- i. That a motor power elevator should be installed instead of the present hand-power elevator.
- j. That an extra clerk be employed to assist the storekeeper in the handling of supplies, leaving the present clerk free to give his whole attention to the storehouse records.
- k. That the present delivery service should be superseded by a service which shall be owned by the Board of Education.

The employment of extra clerical force in the storehouse and the suggested change in delivery service are, of course, dependent on the adoption of the other changes suggested above.



## IV

### ACCOUNTING AND AUDITING

#### 1. Organization

The personnel in immediate charge of the work of accounting and auditing for the Board of Education, and their general duties under this function, are as follows:

a. Secretary

General accountant, and in charge of the clerical force and their work. He keeps the general ledger and incidental fund register, and makes all entries in these books.

b. Bookkeeper

In charge of payrolls, expenditure distribution and voucher registers, audits claims, prepares warrants and voucher-checks, and does any other work required by the secretary.

c. Stenographer

Takes dictation from the secretary, and performs any clerical work assigned by the secretary or bookkeeper.

d. Messenger

Performs the duties of messenger and minor clerical work as assigned by the secretary or bookkeeper.

The secretary's duties are defined by the school laws and the rules of the Board of Education. According to the school laws of the State of Colorado, the secretary, in addition to his secretarial duties, "Shall draw and countersign all warrants or orders issued by the Board, shall keep a register or stub of all orders drawn, showing the number of the order, date, amount, in whose favor and for what purpose drawn" (Sec. 115, Annotated School Laws). The secretary also "shall keep an accurate account of the expenses incurred by the district", and render to the county superintendent an annual "report of the affairs of his district" (Sec. 116, Annotated School Laws). He shall also "render a statement of the condition of the finances, as shown by the books, at any time when required by the school board" (Sec. 119, Annotated School Laws).

Section 8, of rule 6, of the rules of the Board of Education, in effect up to January 13, 1916, provided that the secretary "shall be the general accountant of the Board and the keeper of all account books." The new rules of the Board, adopted January 13, 1916, make no change in the duties referred to in the foregoing quoted sections of the school laws and rules of the Board. The secretary may or may not be a member of the Board, as provided in the school laws. The present secretary is not a member of the Board.

Section 121 of the annotated school laws, referring to the treasurer of the Board, provides that "it shall be the duty of the treasurer to countersign all warrants \* \* \* \* \* and to keep an account of the same. He shall take charge of all moneys received by him on account of the district from the county treasurer, as provided in sections 91 and 92 of this act, and pay out the same as therein provided. He shall render a statement of the finances of the district, as shown by the records of his office at the close of each school year, and at any other time when required by the Board." The treasurer is a member of the School Board.

The only part of the duties of the treasurer, quoted in the foregoing section, which the treasurer actually performs, is the countersigning of warrants. He keeps no accounts and renders no statements. The county treasurer pays no money to the treasurer of the School Board, and all payments are made by the county treasurer. The secretary prepares for the treasurer the annual statement of receipts and expenditures included in the annual report of the Board.

## **2. Methods and Procedure**

### **The Budget**

The budget for each fiscal year is prepared on the basis of the state fiscal period, beginning December 1st and ending November 30th. The school fiscal year covers the period from July 1st to June 30th. Each year's financial requirements are based largely on the amount expended in the previous year, with such modifications in certain items as require special provision each year, such as, for example, teachers' salary increases. Other items are cut or increased, in round numbers, according to the amount available for allotment.

The form in which the budget is set up and amounts allotted, is as follows:

### Budget Form

Improvements	\$
Real Estate	
Furniture and Equipment	
Educational Operating	
Payrolls	\$
Increase, high school	
Increase, elementary	
Retirement	
Supplies	
Text Books	
Library and Reference Books	
Printing and Binding	
Shoes	
Physical Operating	
Engineers and Janitors (Payroll)	\$
Fuel	
Water	
Light	
General Supplies	
Transportation	
Telephone and Postage	
General Expenses	
Maintenance	
General Repairs	\$
Miscellaneous	
Insurance	\$
Interest	

The amounts allotted for the various items in the budget are not set up in the general ledger or in any register, and there is no particular effort made to confine each year's expenditures to the budget allotments. The amounts apportioned to the various items at the time of making up the budget are not supported by inventories of supplies and equipment in each school, department and division, and complete and comparable reports from each department, division, etc., showing, wherever possible, unit costs of work performed. The insufficiency of detail in the budget estimate submitted by the buildings and grounds department, and the lack of any cost records or data in that department as a basis for an intelligent judgment of

the needs for repairs and improvements, have already been referred to in this report.

While salaries for each department, division and office are shown separately at the time of preparing the budget, these are all lumped and included, with the exception of engineers' and janitors' salaries, in the item "payroll" under the heading "educational operating". Thus the salaries of the supervising engineer and his clerk, the salaries of the secretary's office, purchasing department, storehouse, etc., are classified in the budget as "educational operating". Such salaries are not a part of educational cost, in the sense of cost of instruction. This is recognized in the accounting division in the classifying of expenditures, but there is no good reason why the budget statement should state one thing and the accounts another.

Purchase orders, repair or improvement work orders, contracts, etc., are not set up against budget allotments to provide against exceeding the amount allotted in any budget item. It would be impossible without considerable clerical labor, to tell at any given time the amount in any particular budget item that is available for additional expenditures or for incurring additional liabilities. Supplies are purchased or liabilities incurred without any particular reference to the amount of outstanding claims for supplies purchased, or services rendered.

The Board of Directors of School District No. 1 are responsible for the financial and business policy and program of education in the district. This is a responsibility which cannot be delegated to others. The policy and program of the Board for any particular year, relating to new projects, carrying on or extending existing functions and activities or curtailing others, should be, to a considerable extent, indicated in the budget document in such a way that the executive officers and the public may know the kinds of work planned and how much of each.

The powers and responsibilities of the Board of Education are not restricted by the operations of a carefully planned budget which, after adoption, is left to the executive officer or officers to carry out. The will of the Board is expressed in the amounts allotted for various objects of school expenditures. The Board chooses and appoints its chief executive, the superintendent of schools, and may hold him responsible for the faithful carrying out of the policy and program of action, and for an efficient administration.

To exercise control over all employes of the Board and all expenditures made or liabilities incurred, it is not necessary for the Board personally to administer every act and supervise every transaction before it occurs. If so, there would be little need of a superintendent of schools. By a system of periodic reports of financial and other transactions, supplemented by such data or inspection of records or activities as the Board may deem necessary for its purpose, the Board of Education may exercise effective control over school affairs, and may note the efficiency or inefficiency of its employees.

It will be apparent that, to plan intelligently for future needs, the Board must have accurate and reliable data of every phase of educational activities, submitted in such detail and form that previous years' expenditures for each activity may be compared with current year allotments and expenditures, and requests for the succeeding year. With such data, supplemented by inventories of supplies and equipment, and statements of unit costs of operations wherever possible, it will not be necessary to make a horizontal cut of any request or item, or increase another as much as the funds will allow, but instead it will be possible to bring to the consideration of each item careful thought and exact knowledge of the facts surrounding each item.

The budget, as a complete plan or program, should be prepared under the direction and supervision of the superintendent of schools as the chief executive officer of the Board of Education, and submitted by him to the Board for their deliberation and approval or disapproval. Allotments should be made in accordance with the detail of the budget. The Board may, at any time emergencies arise, or whenever there is need for a change in allotments, adjust the budget to the changed conditions. Otherwise, it might be necessary to make allotments in lump sums to permit of elasticity and the exercise of a reasonable amount of executive freedom.

The amounts authorized to be expended should be strictly adhered to, and new allotments made or transfers authorized only in accordance with the same businesslike methods and planning suggested in the foregoing for making up the budget.

Instead of the budget serving merely to determine the tax rate, and then given second consideration thereafter, it should be set up in the general ledger, or in a ledger for the purpose, and all expenditures made thereafter, or lia-

bilities incurred, should be made or incurred only in accordance with the budget authorizations. All expenditure documents, such as purchase orders, work orders, etc., with which claims against the Board originate, should be charged against the budget allotment accounts from which they are payable, at the time they are issued.

This procedure would establish the encumbrance against any budget item and provide against any item being exceeded without proper authority. When a payment is made liquidating a purchase order or other encumbrance previously set up against a budget account, the payment should be posted to the same account and the particular order, etc., checked with a mark (✓) to indicate that it has been liquidated.

At the close of each month, a statement should be prepared by the secretary, showing the balances in each budget item at the beginning of the month, the amount of each expended in the month, the encumbrances against each, and the unexpended and unencumbered balances at the close of the month.

#### General Ledger Accounts

The accounts kept in the general ledger are as follows:

- a. Value of buildings, grounds, and furniture and fixtures for each school building.
- b. Stores account.
- c. Accounts with the School Board treasurer.
- d. General and special fund accounts.
- e. Teachers' retirement fund accounts.
- f. State apportionment account.
- g. Warrants account.
- h. Expense accounts.
- i. Surplus account.
- j. Appropriation account.

The accounting procedure, with respect to transactions affecting the general ledger accounts, is complicated and cumbersome. This is true more with respect to the transactions affecting the setting up in the ledger of the tax levy, the crediting of tax collections and abatements, the debiting and crediting of the general and special fund accounts, teachers' retirement fund account, and the relation of these transactions to the accounts with the School Board treasurer.

The system of accounts and the methods and procedure relat-

ing to them, have been substantially the same since the establishment of School District No. 1 in 1903. The secretary, who has been in charge of the general accounting records for several years, finds it necessary, at times, when asked the purpose and nature of an account, to give a little time and study to the question before he is able to answer it. This is not intended as any criticism of the secretary. It would be difficult to find records, and documents in support of transactions, more carefully or conscientiously kept and filed than those in the care of the present secretary. He has merely carried on the system very much as it was originally established.

### General and Special Fund Accounts

These accounts are charged, respectively, each year with the amount of general fund and of special fund taxes, as authorized in the tax levy. During the year, as miscellaneous receipts are collected, such as school fines, etc., these, also, are debited to the general fund account. Collections of general fund and of special fund taxes, as reported monthly by the county treasurer, are not credited to the general or special fund accounts, or to any other accounts. General fund tax collections are transferred by the county treasurer on his books to the special fund account, so that all warrants may be drawn against one fund account only.

To show these transfers of general fund collections to the special fund account the secretary has an account called "General Fund—In account with Special Fund". At the end of a year this account is closed out into the "District Treasurer" account. When general or special fund warrants are paid, as reported monthly by the county treasurer, these are charged to the "District Treasurer" account and credited to the general fund and special fund accounts, respectively.

The general fund and special fund accounts are not credited by the secretary with any collections of taxes, but instead, are credited with warrants paid, for the reason that the debit side of these two fund accounts contains both cash and uncollected taxes. The secretary has no cash account and he has no taxes account. The two are together in one account for each fund. Therefore, to emphasize this point for clearness, when tax collections are reported by the county treasurer, the secretary ignores them because he has no account to which they can be charged.

The principle of this system is that the county treasurer is



custodian of the cash and is responsible for the collection of taxes. The debit balance in the general and special fund accounts represents, at any given time, the liability of the county treasurer to the school district for cash and uncollected taxes. The secretary cannot tell from the accounts how much is cash and how much is uncollected taxes, according to this system, without having first to refer to the county treasurer's monthly reports, and this information cannot be verified officially until the county treasurer sends in his semi-annual statement, showing the balance of cash on hand and the balance of uncollected taxes at the close of a six months' period.

Transactions affecting the collection of taxes for "Teachers' Retirement Fund" are handled in the same manner as that described in the foregoing for the general fund and special fund accounts. The "District Treasurer" account in the secretary's ledger is kept merely to show the theoretical relationship of the secretary to the district treasurer. The accounts "District Treasurer" and "District Treasurer-Account Teachers' Retirement Fund", are purely fictitious inasmuch as the district treasurer (treasurer of the School Board) neither receives nor pays out any School Board moneys and keeps no accounts or records of financial matters of the Board.

The account "District Treasurer—Account Teachers' Retirement Fund", is carried by the secretary, he says, principally to show at a glance the amount paid out of this fund. The debit balance in this account agrees with the credit balance in the "District Treasurer" account, but this balance does not agree with the balance in the "Teachers' Retirement Fund" account, which is the true balance. The difference arises from the fact that the latter account shows all the transactions affecting the teachers' retirement fund as reported monthly by the county treasurer, including collection fees, interest charges, etc., whereas such charges as fees, interest, etc., are not posted to the accounts with the district treasurer.

The account "District Treasurer—Account Teachers' Retirement Fund" would be unnecessary merely to show the secretary at a glance what has actually been paid to beneficiaries of the fund, if cash and taxes were not intermingled in the one account "Teachers' Retirement Fund".

As an illustration of the number of journal entries and postings necessary to record in the general ledger an item of

miscellaneous receipts as reported by the county treasurer, the following is submitted:

(1) District Treasurer.....	\$62.81	
To General Fund.....		\$62.81
(2) General Fund.....	62.81	
To Appropriation.....		21.00
District Treasurer.....		41.81
(3) Special Fund.....	62.81	
To Gen'l Fund. In account		
with Special Fund.....		62.81
(4) District Treasurer.....	41.81	
To Miscellaneous Receipts..		41.81

The above journal entries are actual entries taken from the books of the secretary. The item of \$62.81 is made up of \$21.00 received from court fines and \$41.81 of other miscellaneous receipts collected in the schools. Entry No. 3 above shows the transfer of general funds to the special fund account to facilitate the paying of warrants from one fund account. At the end of the year the account "General Fund—In account with Special Fund" is closed out into "District Treasurer" account.

Thus the district treasurer's account is debited and credited four times and general fund account debited and credited once with the same amount. The carrying of a district treasurer account to record a theoretical relationship and the fact that general fund accounts contains both cash and uncollected taxes is responsible for so many entries to record an item of miscellaneous receipts. The procedure and almost similar number of entries are required for tax collections and other transactions. If the district treasurer's account were eliminated and fund accounts kept to show cash transactions only, the recording in the ledger of the above item of \$62.81 could be done with a single entry as follows:

General Fund Account.....	\$62.81	
To Miscellaneous Receipts.....		\$62.81

To transfer the funds from general fund account to special fund account, the following entry only would be needed:

Special Fund Account.....	\$62.81	
To General Fund Account.....		\$62.81

The account called "Appropriation" is a sort of closing or balance account. This account is credited each year with

the total amount of the tax levy, additional assessments, incidental fund collections, miscellaneous receipts, etc., and charged each year with all expenditures for a year, abatements of taxes, etc. The credit balance in this account, at the close of a school fiscal year, plus warrants outstanding, salaries accrued and unpaid, etc., exactly agrees with the total of all uncollected taxes and of cash on hand.

The system of accounting should be revised to eliminate as much as possible unnecessary accounts and also to show in the ledger the cash on hand and the taxes uncollected at a given moment of time.

The present procedure of general accounting does not provide for showing a revenue and expense statement for each school fiscal year's operations. The revenues from taxes and other sources are not apportioned to each school fiscal year. It is unfortunate, from a bookkeeping standpoint, that two different fiscal periods are involved in each year's School Board affairs, viz.: the state fiscal year, which ends November 30, and the school year, which ends June 30. Taxes are due and collectible January 1st and July 1st of each year. The full amount of the tax levy each year is set up on the School Board ledger at the time the levy is authorized by the state taxing body. The tax levy is based on the needs of the school district for the state fiscal year. The School Board, however, must think in terms of the school fiscal year. Unless an accurate apportionment of revenues is made along the lines of the school fiscal year, there is liable to be misunderstanding as to the real state of affairs at a given period of time.

The result of operations for a school fiscal year, on which basis the School Board must plan its activities, can be determined only by an apportionment of the revenues applicable to such period. An apportionment is necessary, also, to an accurate determination of any free or unencumbered balance in the treasury for making further appropriations or incurring additional liabilities.

With an accurate apportionment of the revenues and the charging of all expenses in the periods in which they belong, the secretary of the School Board could prepare, at the close of each month, an operating statement for a month, together with a balance sheet and other statements of account, in comparative form. With such data presented to it, including the budget statement previously suggested herein, the Board of Education would be kept currently informed of the financial affairs of the district.

### Stores Account

This account, as carried in the general ledger, merely shows the value of the inventory of educational and general supplies in the general storehouse at the close of a fiscal year. The account is established, not to exercise control over the storekeeper, but merely to set up on the general ledger the asset "stores" for balance sheet purposes. No account is taken of the balances of stores in the buildings and grounds department, in the manual training department, or in storerooms in schools. The voucher register shows each month the purchases of supplies delivered to the general storehouse, departments, schools, etc., but these entries record merely the supplies for which invoices have been approved for payment.

Many consignments of supplies are delivered to the storehouse, or to a department, weeks before the invoices for such deliveries are entered in the voucher register. The purpose of a stores account or accounts in a general ledger is twofold, viz.: (1) to establish control over all supplies wherever stored and locate responsibility and accountability therefor, and (2) to ascertain the value of supplies on hand at balance sheet periods without the need of an actual count of the articles in stock.

This twofold purpose of stores accounts in the general ledger may be exercised merely by requiring that the storehouse or other distributing point shall report daily all supplies received, that reports shall be made at stated times of all issues of supplies to schools or departments, and that properly signed receipts for all issues shall be kept in the storehouse, or other distributing points, to verify reports of issues at any time desired by the accounting department.

### Departmental Cost

The present method of distributing salary and supplies cost to departments and schools is inaccurate and inconsistent. Annual reports, or other statements of costs compiled from the present records, are misleading in so far as departmental cost is concerned. For example, supplies for the drawing department are stored in the general storehouse. All drawing supplies issued to schools are charged to the schools as "school supplies," and not to the drawing department for each school. If any supplies should be purchased for direct delivery to the drawing department by a vendor, such supplies would be charged to "Drawing Department" and not to a school.

Again, supplies for domestic science classes may be delivered to schools from the storehouse or direct from dealers. In either case they are not charged to the respective schools, but instead to "Domestic Science Department." Salaries of domestic science teachers are charged to the department and not to schools, whereas salaries of drawing department teachers are charged to the schools and not to the drawing department.

The same is true with respect to kindergarten department and sewing department salaries and supplies. Most of the kindergarten supplies are charged to schools as "school supplies" and salaries of teachers are charged to the kindergarten department. Sewing department supplies for high schools are charged to high schools in the account "School Supplies." Sewing supplies for grade schools are charged to the sewing department and not to the schools. Salaries of sewing teachers are charged to the schools.

This method of distributing cost has nothing to justify it from any standpoint. The fault lies, probably, in the fact that the expense distribution register is not designed to show the cost of departments in schools as distinguished from regular grade work. Hence, when departmental supplies are sent to a school they are classified as "school supplies." But this does not explain the reason for charging departmental teachers' salaries in two different ways.

#### School Property Returned to Storehouse

Supplies or equipment returned from any school to the storehouse are not credited to the asset or expense accounts to which they were originally charged, unless the articles are returned in the year in which they were charged out. As stated in the section relating to the storage and distribution of supplies, no report is rendered by the storekeeper of returned supplies or equipment. Pupils' desks are taken from schools for cleaning and repairing. It happens frequently that some of these desks are not replaced by others, for one reason or another, but no credits are given to school property accounts in such cases.

The system of handling returned desks, and of charging the cost of repairing them, is open to criticism. The storekeeper notes all returned desks in his register of second-hand property. When other desks, cleaned and repaired, replace those taken from a school, no charge is made to the school for the cost of the repair work done on the desks. Yet, if any repairs to desks are done in a school the labor

and material cost would be charged to the school. The system should, at least, be consistent. The most equitable way to handle all returned supplies would be to credit the property or expense account originally charged with the articles returned.

If supplies were charged to an expense account in a previous year, and are fit for reissue, a new value should be placed on them and credit given in the profit and loss or surplus account to the amount of this new value. For all desks returned for cleaning and repairing, to be replaced with other desks, the cost of cleaning and repairing should be charged to the schools which receive the repaired desks. Desks returned to the storehouse for repairing should have a reduced value given to them for inventory purposes, pending the repairing of the desks.

The repair shop should make requisition on the storekeeper for all desks to be repaired. The storekeeper would issue the desks in lots of 25 or 50, crediting his stock records and charging the desks, at inventory value, to the shop. Each lot of desks in the shop would receive a work order number issued by the storekeeper, and the cost of labor and material, as reported by the shop, would be the cost of repairing each lot of desks, and establish the new inventory price for repaired desks to be placed in stock for reissue to schools. This system of handling returned desks and the charges for repairs presumes the keeping of certain accounts in the general ledger, such as "Repair Shop" account, etc., to record the cost of labor and material charged to repair shop, and to make the proper credits thereto each month for work completed. It presumes, also, that time and material reports from the repair shop are kept, showing the cost of each job or lot of desks repaired.

#### Supplies and Equipment—Classification

One of the greatest obstacles in the way of accurate and uniform statements of cost in any undertaking, public or private, is a loose system of classifying and distributing expenditures. The Board of Education has not adopted a standard classification, clearly distinguishing objects of expenditure and defining supplies and equipment. Such standard is clearly needed under the present organization, where so many different persons determine the account to which an expenditure shall be charged.

The secretary and the bookkeeper make every effort to be consistent in their distribution of purchase vouchers, but

they have to depend upon their memory in such matters. A standard classification, printed and distributed among all departments and employees concerned, would materially assist in a uniform system of charging to accounts and would serve as a basis and guide in the preparation of property accounts. In connection with a system of accountability and responsibility for personal property, it will be absolutely necessary to prepare a classification of personal property before any effective steps can be taken to control such property, wherever located, belonging to the Board of Education.

In general, it may be said that supplies include all those things which are immediately consumed in use. Equipment would include all those things which are not immediately consumed in use, but which are planned for continuous use over a certain period of time. The determination of the things included in these categories must, however, be a matter for executive ruling.

#### Repairs and Improvements—Classification

The present policy of the supervising engineer is to classify as "repairs" any labor or material expended in repairing a building or repairing or replacing any equipment or parts. If the work done is new work, however, even to the placing of a knob on a door which previously lacked such appurtenance, it would be classified as "improvements." Charging to "improvements" instead of to "repairs" means that the charge is set up on the books as an asset instead of as an expense, or cost of operation. Theoretically, the supervising engineer is probably correct in his distinction as between repairs and improvements. Practically, however, the distinction can be carried to unreasonable lengths.

Every job, or piece of work, classified as improvements, reduces the cost of operation by the exact amount so classified. A better showing is made by such practices. The capitalizing of all improvements is not, however, due to any influence on the part of the supervising engineer, or other officer or employee of the Board of Education, to make a favorable showing in operations. It appears to be due entirely to the literal carrying out of the principle that what is not a repair or replacement must be an asset, and therefore must be capitalized.

While an improvement or addition to plant or equipment is not a repair or replacement, yet it does not follow that it



should be capitalized. It may, however, be an expense in that no permanent value has been added to the plant or property of the district. As stated in connection with remarks on depreciation, the cost of a new school building is an expense or cost of education. It is capitalized because it has a definite use for a certain number of years of operations and should be apportioned over those years.

A conservative policy should be followed in charging to asset or expense accounts. No item of expenditure for work done in the building and grounds department should be capitalized unless the cost is of such size as to be fairly apportionable over a number of years. Those things which are recurring or are incidental to operation and maintenance of schools each year would be better charged to expenses than to asset accounts, although they may still be called improvements to distinguish them from expenditures incurred due to wear and tear.

### Depreciation

Depreciation, as an element of expense in the cost of operations, has never been treated in the School Board accounting. In December, 1914, the Board of Education, by resolution, authorized the writing off of \$1,324,396, as representing the shrinkage in value of school buildings and equipment. This amount was charged off the cost of school property as represented on the books, not so much due to a just recognition of the principles of depreciation, as to the need for a revision of the amount of insurance carried on school buildings and equipment. By the same resolution, however, the Board authorized the secretary to write off, or make a charge in the accounts for, depreciation each year thereafter.

The method and rate of depreciation were not stated or recommended by the Board in its resolution. Owing to this uncertainty and the starting of the present school survey, the secretary, with the approval of the Board, decided to postpone action on the question of depreciation until the survey was completed.

The charging off, in one year, of \$1,324,396, is evidence sufficient in itself, to emphasize the need of a proper annual charge which shall distribute the cost of depreciation over the years during which school property is in use, regardless of insurance premiums or other considerations.

The appraisers' report in 1914 merely stated the estimated value of buildings and equipment as of that date. That

report determined the necessary amount of insurance to carry for the time being. Apparently, questions as to the probable remaining life of the property appraised, and of the rate of depreciation, were outside the scope of the appraisement. Before the secretary can establish the rate of depreciation on buildings and equipment to charge off each year thereafter, it will be necessary to have another appraisement or examination of all school property to list separately the various kinds of buildings, and the mechanical plants and other equipment in buildings. The appraisers' report shows only a total valuation on each school building and another total valuation for all the equipment in each building.

It is manifestly impossible for the secretary to establish an equitable rate of depreciation without having a classified list of all buildings and equipment. The determination of the probable life and residual value of buildings and equipment obviously is a question for technical experts. Each building and plant or other asset must be considered by itself, if a just and fair estimate is to be made.

This should not be an obstacle in the way of arriving at an annual charge for depreciation. The cost of education for any fiscal year is understated when it does not include a charge for depreciation. The very fundamental principles of accounting, as an exact science, demand the recognition of all elements of expense which enter into the cost of operations, and depreciation, to the extent of the decline in value of the property used, is one of the least items of cost that should be overlooked. School Board accounting, though not designed to show profit or loss, is nevertheless incomplete and inaccurate when it omits depreciation.

The cost of education is not determined by the amount spent for salaries, repairs, fuel, supplies, etc. Millions of dollars, besides, are invested in plant which each year is declining in value, and without which education would be difficult if not impossible. The total cost of a school building is a cost of education. It is set up in the books, at the time of purchase, as an asset instead of an expense, for the reason that it has a certain number of years' usefulness as an instrument in facilitating the educational process. In time it must disappear.

It would be unfair to charge the whole cost of a new building to the cost of operation of the year in which the building was purchased. It is equally unfair to omit distribu-

ting the cost over the years during which the building is in use and charge the whole cost to surplus when it is no longer serviceable.

There are several methods of charging depreciation. The simplest of these is merely to charge each year a fixed per cent of the original cost of the property, less the residual value. Another method is to charge each year a fixed percentage of the decreasing net value. The advantage of this second method is that the diminishing rate of depreciation charged each year of the life of the property is inverse to the increasing cost of repairs, thus equalizing the charges to operation account of repairs and depreciation over the years during which the property is in use.

### Voucher Register and Register of Distribution of Expenditures

All vouchers for claims against the Board of Education, including payrolls, are entered in the voucher register and also in the register of distribution of expenditures. The columnar headings in these two registers, with respect to the classification of accounts into which vouchers are distributed, are exactly alike. The difference between the two registers is that the voucher register records all claims in the order in which they are entered, while the expenditure distribution register distributes the claims according to the school or department to which they are chargeable, there being a separate sheet for each school and department in this register.

At the close of each month the secretary posts to his general ledger the totals of each column in the voucher register showing entries made during a month. The accounts in the general ledger correspond to the columns in the voucher register.

While there is an advantage in distributing each voucher to the same accounts in two different registers, from the standpoint of accuracy of work and the localizing of errors, yet there could be a saving in the bookkeeper's and the secretary's work if the voucher register were designed to show expense controlling accounts only. In such case, errors in posting, if any, could still be localized, but as between controlling accounts instead of the individual accounts. Also, the secretary would post to his general ledger each month the totals of the controlling accounts, of which there are four under the present system, instead of posting the totals of twenty expense accounts.

The expenditure distribution register would show all the expense accounts. A trial balance of this register at the close of any month, taking the totals for each school, should, with the proposed change, reconcile with the controlling accounts in the general ledger and voucher register.

The present classification of expenditures is inadequate to show all the information relating to expenditures which should always be available without the necessity of costly analysis of the accounts. Further, the expenditure distribution register is not designed to show for each school the cost of the various departments. The expenditure distribution register is ruled to show the following distribution of expenditures:

Property Accounts

- Real Estate
- New Buildings
- Furniture, Equipment and Apparatus
- Improvements

Educational Operating

- Payroll
- School Supplies
- Text Books
- Library and Reference Books
- Printing, Binding and Stationery

Physical Operating

- Engineers and Janitors (Payroll)
- Fuel
- Water
- Light
- Rent
- General Supplies
- Transportation and Express
- Telephone and Postage
- General Expense

Maintenance

- General Repairs
- Repairs Heating Plant and Plumbing
- Repairs Furniture, Equipment and Apparatus

Miscellaneous

- Insurance
- Supplies for Indigent Pupils (Shoes)

There is no need of repeating the property accounts in this register. The voucher register shows the expenditures for property purchased, segregated according to the classes of property, and the secretary posts these in detail in his general ledger. The expenditure distribution should be strictly an expense distribution register for each school, department, etc.

According to the classification of expenditures, as given above, "payroll" under "educational operating," includes all salaries of principals and teachers without regard to the divisions or units into which educational cost may be separated. The same is true concerning "school supplies." The classification of expenses under the heading "maintenance" is, also, too limited for administrative purposes.

In contrast to the present classification of expenses, the following is submitted for consideration as a suggestive classification which would give more detailed information, by functions, concerning the cost of instruction, operation, and maintenance of each school.

#### 1. Instruction

##### a. School administration

- (1) Salaries, principal and clerk
- (2) Services other than personal
  - (a) Postage
  - (b) Miscellaneous
- (3) Supplies

##### b. Teaching

- (1) Salaries (Payroll to show details relating to departments, etc.)
- (2) Supplies
  - (a) General
  - (b) Manual Training
  - (c) Drawing
  - (d) Sewing
  - (e) Domestic Science
  - (f) Physical Training
  - (g) Music
  - (h) Kindergarten

## 2. General Supervision over Business Affairs

### a. Operation of school plant

- (1) Salaries and wages of janitors and engineers
- (2) Services other than personal
  - (a) Power, light
  - (b) Water
  - (c) Rent
  - (d) Freight and cartage
  - (e) Postage
  - (f) Miscellaneous
- (3) Supplies
  - (a) Fuel
  - (b) Cleaning and toilet
  - (c) Lighting
  - (d) Miscellaneous

### b. Maintenance of school plant

- (1) Buildings
- (2) Grounds
- (3) Boiler plant
- (4) Ventilating plant
- (5) Lighting apparatus
- (6) Classroom and office equipment
- (7) Plumbing and steamfitting
- (8) Tools and implements—plant

With a classification of expenses for the administrative and business departments, by objects and sub-headings similar to the foregoing tentative classification of expenses for schools, most of the information desired from the general accounting department would be immediately available for administrative purposes. This classification presumes the existence of cost records in the buildings and grounds department showing unit and job costs of all maintenance work for which only the main classification headings would be shown in the general accounting records. It presumes also that a stores distribution record, kept in the general storehouse or elsewhere, will show every item of supplies used in the schools or departments, as details supporting the general accounting records. Both the job cost and the stores distribution records are recommended in previous sections of this report.

### Miscellaneous Cash Collections

All cash receipts collected by or deposited with the secretary are turned in to the county treasurer and credited by the

secretary to the account "miscellaneous receipts" in the general ledger. Such collections include receipts from high school lunch rooms, domestic science classes, fines, etc., collected from pupils, sales of supplies, etc. The most important of these, with respect to the amount collected, is the amount reported to the secretary by the high school lunch rooms.

During the fiscal year 1914-15, \$10,237.99 was credited to miscellaneous receipts from this source. During the fiscal year 1915-16 (7 months' operations) there was credited \$12,633.06. Under an exact system of accounting all such receipts should be credited to the departments or divisions which produce them. In that way, the actual net cost of operations of each department would be discernible. It would be difficult, if not impossible, under the present system of accounting, to determine the cost of operations for each department.

The method, also, of handling domestic science receipts should be changed. While the total amount collected is said to be comparatively small, it is expended by teachers in purchasing domestic science equipment and in paying grocery bills. Only the balance unused at the end of a fiscal year is turned in to the secretary by the supervisor of the domestic science department. The supervisor agrees that the present practice of disposing of cash collections in the department is wrong, and makes statements of cost of the department inaccurate to the extent of such purchases and payments.

### Inventories of Supplies and Equipment

Inventories of supplies and equipment are rendered at the close of each fiscal year by each school and by the general storehouse. There is no one in the business departments who seems to have been responsible for the correctness and verification of inventory returns. The indifference and laxness in this matter has resulted, it is said, in an attitude of carelessness on the part of the persons required to make annual inventory returns.

A person responsible for property, knowing his report thereon will be merely filed unchecked or unverified, and that in fact, there is no adequate system in the business departments for checking his inventory, is not going to give the same close attention to the care of property and the preparation of inventory returns thereon, that he would give if he knew he was charged with every article of property and



that the records were effective to establish his responsibility for all the property in his custody or use.

Inventory reports, under any circumstances, require considerable labor to prepare. It is an absurdity, however, to impose this labor without any means of utilizing or verifying the reports. Property represents cash. It should be accorded all the protection given to cash. There can be no effective control over personal property until a property clerk or other person is designated specifically to take care of all property records, and there have been established definite regulations, forms, and records for the guidance of all persons concerned. It is recommended, therefore, that a clerk be designated to have charge of all personal property records pertaining to school property in the district and that he be provided with the necessary forms, records, and regulations to make effective this control.

#### Invoices and Discounts

The procedure of approving and paying invoices is still faulty and unsatisfactory. Prior to the current calendar year invoices were held up in departments and in the storehouse for weeks and months, for one reason and another, awaiting approval, most of which delays were unnecessary and could have been avoided under an efficient business administration. Conditions in this respect have improved in the past few months, but this is due more to diligent effort on the part of the employees of the secretary's office than to any material change in the method of handling invoices.

Permanent improvement in expediting the work of approving and settling claims against the Board of Education for supplies purchased is difficult where the system requires invoices to pass through a half-dozen different pairs of hands for approval. The procedure, with respect to the approval and settlement of invoices for purchase of educational and general supplies, is as follows:

- a. Invoices are received in the purchasing department from vendors.
- b. They are examined by the supply clerk, stamped with a rubber stamp for the signature of the head of the department, school, etc., that received the goods, and mailed to the department, school, etc., concerned, or left in the office till the approving officer comes to the purchasing department. The date on which the

invoices are forwarded for approval is noted in the register of orders.

- c. The storekeeper, principal, or other person receiving invoices for approval, signs the invoices and returns them to the supply clerk.
- d. The supply clerk again looks over the invoices and, if they are properly approved, turns them over to the bookkeeper in the accounting department. The date they are given to the latter department is entered in the register of orders.
- e. The bookkeeper checks all invoices as to extensions and additions, compares the prices on the invoices with the prices on the purchase order, examines all approving signatures and other details, and if correct initials the face of the invoice. The bookkeeper then prepares a voucher for each claimant and forwards the vouchers to the secretary's office.
- f. The superintendent of schools and the secretary each sign all vouchers, the secretary to the effect that they have been examined and found correct and the superintendent that they are approved for payment. (The superintendent is at present approving vouchers pending the appointment of an assistant superintendent in charge of business affairs). The secretary also "attests" the check portion of each voucher. The vouchers then are returned to the bookkeeper.
- g. The bookkeeper then registers all approved vouchers in the register of vouchers, after which they are forwarded to the private business offices of the president of the board and the treasurer of the district respectively, for the signatures of those officials.

The procedure with respect to the invoices for purchases made by the buildings and grounds department is as follows:

- a. Invoices are received in the supervising engineer's office from vendors.
- b. They are checked as to prices, etc., by the supervising engineer and his clerk, and a certificate attached to each invoice, or number of invoices for the same claimant. The certificate certifies the correctness of the claim or claims, and shows the school buildings to which the total amount of the certificate is distributed.

- c. The invoices and certificates are then sent to the bookkeeper in the accounting department, from which point the procedure is the same as that outlined above for the invoices for educational and general supplies.

It must be clear from the foregoing procedure of handling invoices, that it will require some change if the Board of Education ever hopes to discount its bills or even to settle claims in the shortest space of time consistent with good business. The first step in improving this procedure should be the discontinuance of sending invoices out of the supply department, once they have been received from dealers or claimants. This would eliminate the weakest part of the present system and the cause of the greatest delays in settling claims promptly.

One serious objection to sending purchase invoices to schools, departments, etc., for approval, is that the invoices frequently are not received until weeks, and sometimes months, after the supplies have been received or used. The correct approval of invoices under such circumstances is entirely up to the person approving, whether he depends upon his memory or has records to assist him in remembering all the details of some past transaction.

There are several ways in which invoices may be approved without the necessity of sending the invoices to the delivery points. One of the most effective of these, when the manufacturers and merchants, from whom the Board of Education receives its supplies, become familiar with the system, is the practice of sending two copies of a purchase order to a firm, one to be delivered with the goods and the other to be retained by the firm. This system requires, however, that the purchasing department shall in every case know, definitely whether goods can be delivered in the quantities desired and when they are desired. The purchasing department controls the situation absolutely with respect to the issuing of orders.

If, however, only casual attention is paid to these important questions of quantities and time of delivery, and orders are issued for supplies which a dealer can fill only partially and at odd times, it will be impossible to get satisfactory results from the system of requiring a copy of each order to be delivered with goods.

With this system working efficiently from the purchasing department end, every delivery of supplies will be accompanied by a copy of a purchase order. The person receiving

the goods will use this copy of order to check off the goods and to certify thereon that they have been received in the quantity stated thereon. (The question of quality will be determined by the inspector of supplies, if one is designated. If not, then by the storekeeper or the person for whom the goods were purchased.) All copies of purchase orders then would be forwarded to the purchasing department through the general storekeeper, whether supplies were delivered by dealers direct to a school or to the storehouse.

When the receipted copies of purchase orders reach the purchasing department, they would be attached to the invoices and the latter would be approved on the authority of the signatures of receiving agents on the copies of orders, and, also, on the authority of the separate reports of the inspector of supplies. If the copies of purchase orders and inspector's reports should reach the purchasing department before the invoices, they would be filed in alphabetical order, by firm names until the invoices are received.

Another method of approving invoices without sending the invoices around to the different departments, requires that the receiving agents tabulate or list the articles received and forward the lists to the purchasing department. The disadvantages of this system are, that it requires more or less writing of details of supplies, order numbers, firm names, etc., to be of value to the purchasing department, and many orders will be incomplete and outstanding indefinitely. So far as deliveries to the storehouse is concerned, the storekeeper would have to list on his goods received sheets (recommended elsewhere herein) all supplies received. But it would be a more difficult matter writing out these lists where supplies are delivered direct to schools. The lists would have to be checked against the file copies of orders each time a delivery was made on order, if there should be several on one order, which is a frequent occurrence under this system.

A third system, requiring delivery of invoices with delivery of goods, is effective if dealers will observe the requirement. The usual experience is that dealers will not stop to make out invoices to accompany deliveries of goods.

The volume of invoices received is naturally affected by the number of separate purchase orders issued. During the ten months from July 1, 1915, to April 30, 1916, approxi-

mately 5,600 invoices passed through the accounting department for payment. With the adoption of changes in methods of purchasing, etc., suggested in the section on purchasing of supplies, there should be a considerable reduction in the number of invoices registered. There would be a corresponding reduction in the clerical labor of the whole business organization in checking invoices, certifying vouchers, signing voucher checks, and registering claims, as a large number of the invoices are payable to the same claimants each month for supplies used currently but purchased in small quantities.

To determine the average elapsed time from the date invoices are sent around to departments for approval to the date the vouchers are prepared, analysis was made of all the invoices received and paid in the months of September, October, and November, 1915, and the month of February, 1916. In all cases noted, there was no way of determining the elapsed time between the date when invoices are received back in the purchasing department from approving agents to the date that department turned the invoices over to the accounting department for vouchering. Also, there is no way of determining the time it takes the several officers to sign and approve vouchers and countersign voucher checks.

The elapsed time for the several stages through which invoices pass under the present procedure, for which any record is available, was as follows:

MONTH	From Date	From Date
	Invoices Were For- warded for Approval to Date Forwarded to Bookkeeper	Invoices Were Forwarded to Bookkeeper to Date of Voucher
Sept., 1915.....	Av. 23 to 24 days	Av. 8 to 9 days
Oct., 1915.....	Av. 25 to 26 days	Av. 9 to 10 days
Nov., 1915.....	Av. 22 to 23 days	Av. 7 to 8 days
Feb., 1916.....	Av. 14 to 15 days	Av. 7 to 8 days

During the period from July 1, 1915, to May 1, 1916, only \$86.58 was earned in discounts for prompt payment of invoices for supplies. Of this amount, only \$8.08 was earned from purchases made by the buildings and grounds department. These figures were furnished by the accounting department. The exact or even approximate amount of supplies purchased by the buildings and grounds department for the period could not be ascertained from any records without an analysis of all vouchers. The total annual amount for supplies, exclusive of coal and wood

for all departments, however, is said to be approximately \$50,000. It will thus be seen to what a small extent cash discounts are received.

The fault is largely in the system of purchasing and the delays in passing bills for payment. The buildings and grounds department is stated to be responsible for delays in settling bills for supplies purchased in that department. But as the supervising engineer has to attend to the approving and checking of bills in addition to his other work, delays must be expected in that department.

There are a number of invoices still pending in the purchasing department, dating back as far as 1912. In the case of these old bills, nobody seems to know who incurred the expenditure or who received the goods. Some of the bills dating from 1915 and recent months are held up for errors, shortages, etc. In some cases dealers themselves are responsible for delays in settling their claims. They omit to put order numbers on invoices, and they frequently send invoices which include items not delivered, to say nothing of sending supplies which are not in accordance with specifications. Under an efficient and forceful business system, conducted along lines which insist on a definite procedure, and the strict observance of this procedure by every employee or other person having dealings with the Board of Education, the Board should eliminate many of the difficulties of the past and now surrounding the proper despatching of business. Before the Board can dictate methods, etc., to be followed by firms in their business dealings with the Board, the Board must have an organization and system of doing things which will command the respect of merchants.

The approving certificates on invoices are inadequate and incomplete in the particulars as to what is being certified to. For invoices representing purchases of educational and general supplies, the signature of the person who received the goods (if not delivered to the general storehouse) merely states, in most cases, that the goods were O. K. in accordance with the rubber stamp instructions of the secretary on the face of the invoice, as follows:

“If correct, please O. K. and return immediately.”

If the supplies are delivered to the storehouse, then the storekeeper signs the invoices, using a rubber stamp as follows:

“These Goods Received—Prices Correct.”

The supply clerk makes no certification whatever as to correctness of invoices for supplies purchased through the purchasing department, and the bookkeeper, who checks prices, extensions, additions, etc., merely initials each invoice on its face.

Every signature to documents supporting claims against the Board of Education should state specifically what is being certified or approved, and no person should be required to sign any document except the person who has knowledge of the fact to be certified or approved.

### Vouchers and Voucher Checks

The present forms of voucher and voucher-check are unnecessarily cumbersome in size and require more writing than is usually necessary for the purpose. The voucher-check is separate from the voucher. The size of the voucher is 8½"x14". The size of the voucher-check is 8½"x7". The design of the voucher and the voucher-check is the same on one side for writing, by carbon process, the particulars of each voucher. A complete list of all the schools and departments is printed on the voucher to facilitate distributing the amount paid on each voucher.

While the particulars of each claim may be written on the voucher and the voucher-check by carbon process, yet the check portion of the voucher-check must be written separately as to date, name of payee, etc., and the distribution must be written separately on the voucher. The voucher-check does not show the distribution or the accounts to which it is chargeable.

These defects could be remedied, with a saving in clerical labor, by the adoption of a voucher form which would require only one writing to fill out the particulars of each claim, the distribution of the amount, the date, name of payee, etc. By establishing a code system for designating the accounts included in the classification of expenditures, the code symbols could be written on both the file copy of voucher and the portion containing the check sent to the payee.

### Payrolls

Payrolls are now prepared in the accounting department for salaries of principals and teachers, janitors, and the employees in all the business departments, with the exception of the buildings and grounds department. Payrolls for principals' and teachers' salaries are prepared from



monthly time reports rendered by principals and supported by other records in the secretary's office.

An addressograph machine is used for writing on payrolls each month the names of all regular teachers. When the payrolls are completed, they are sent around to the schools for signatures of principals and teachers.

Owing to the necessity of sending payrolls around to the schools for signatures, another payroll record is required to be made out for the office files. This record, called "Payroll Check Register," shows the names of principals and teachers (entered by addressograph machine, also), date of warrant, number of warrant, amount, and date of payment.

The average number of names on each payroll sheet per grade school was found, on actual count, to be thirteen per month (including the janitor). With this small average number of names to a school, it would seem a more efficient procedure to have each school prepare its own payroll. The principal could certify to its correctness and send it in to the secretary at the close of each payroll period.

So far as teachers' signatures to payrolls are concerned, these may be dispensed with under a different system of making payment for teachers' salaries. If a special form of payroll voucher-check were designed containing printed information on its face, or a watermark, to the effect that it was a check in payment of salary, the period covered in the payment could be filled in with the amount, and the signature or endorsement of a teacher on a returned check would be sufficient evidence of the payment of salary to that teacher for the period stated thereon.

Under the present procedure, the bookkeeper, secretary, and a clerk are occupied several days each month in making out payrolls and auditing their own work. Under the suggested plan, one clerk would be sufficient to audit the payrolls and make out the warrant checks. The payrolls would not have to be sent around to the schools for signature and time reports would be unnecessary. Also, it would be unnecessary to make out the "Payroll Check Register."

Aside from these considerations, there is another point which may make it desirable and necessary for teachers' payrolls to be prepared in the schools. This is the question of getting the cost of instruction by departments, etc., as suggested previously herein. Principals are best situated to

segregate the time of teachers engaged in the various grade and departmental work in schools. To make this segregation, a payroll may be utilized, with considerable advantage and economy of effort, just as conveniently as a time report or other statement.

## V

## GENERAL

**Construction of New Buildings**

In a preliminary report on the business administration issued in January, 1916, reference was made to the proposed plan of the Board of Education to finance the construction of new school buildings from a fund of over \$200,000 received about that time from back taxes, and an alternative plan was suggested in the report to the effect that new school buildings be erected from the proceeds from the sale of bonds on the serial plan. It was pointed out, also, in the preliminary report that the physical condition of the school buildings at the time would require an expenditure of many thousands of dollars to put them in proper shape, and that this could best be done by utilizing the said fund for the purpose.

The practice has been, since the consolidation of the present school district in 1903, to provide by taxation for new school buildings. Thus the whole cost of such buildings falls at one time on the present-day taxpayers, whereas the school buildings have a life of from twenty to thirty years. If new school buildings, as needed, were financed from sales of bonds, the burden of the cost would be distributed uniformly over the life of the property.

There seems to be little question nowadays as to the most efficient way of issuing bonds for public improvements. The very common practice at one time of issuing long term bonds with sinking fund provisions for liquidation of the debt is frequently being superseded by the issue of serial bonds. Under the sinking fund plan it has been found in a number of instances in American city and state governments, that too many things depend upon a wise operation of sinking funds. In some cases appropriations to sinking funds were not always made. Again, too much was set aside to sinking funds in certain years. The serial bond method, besides being more economical, removes all uncertainties as to sinking fund provisions. Under this plan, each year a portion of the principal is liquidated.

In certain quarters, where investment interests look more favorably on a long term bond, such bonds may be more desir-

able than the serial bonds, which each year return a portion of the principal, necessitating reinvestment. From the standpoint of the state, city or other body issuing bonds, the serial bond method is superior to the long term bonds on the sinking fund principle, other things being equal. To illustrate the saving by the serial bond method over the long term bonds, the following examples are quoted:

This table works out the difference in cost of a loan of \$1,000,000 for 20 years, bearing the interest rate of 4 per cent, on the assumption that the sinking fund can earn: (a) 3 per cent; (b) 3½ per cent; (c) 4 per cent.

\$1,000,000 at 4 per cent for 20 years. Comparison between sinking fund and serial bond methods:

By the sinking fund method the interest at 4 per cent is.....	\$ 800,000.00
By the serial bond method the interest at 4 per cent is.....	420,000.00
Difference in interest in favor of serial bonds.	\$ 380,000.00

(a)

\$1,000,000.00 sinking fund requirements for 20 years on a 3 per cent basis, the decimal for \$1.00 being .038654.....	\$734,426.00
\$1,000,000.00 at 4 per cent for 20 years, interest.....	800,000.00
Cost of loan, sinking fund method	\$1,543,426.00
\$1,000,00.00 20-year serial bond, 1-20, or \$50,000.00 payable yearly .....	\$ 1,000,000
Interest (annually diminishing) total at 4 per cent.....	420,000
Cost of loan, serial bond method..	1,420,000.00
Difference in cost in favor of serial bond method .....	\$ 114,426.00

(b)

\$1,000,000.00 sinking fund require- ments for 20 years, on a 3½ per cent basis, the decimal for \$1.00 being .036657.....	\$696,483.00
\$1,000,000.00 at 4 per cent for 20 years, interest .....	800,000.00
Cost of loan, sinking fund method	\$1,496,483.00
Cost of loan, serial bond method.	1,420,000.00
Difference in cost in favor of serial bond method .....	\$ 76,483.00

(c)

\$1,000,000.00 sinking fund require- ments for 20 years, on a 4 per cent basis, the decimal for \$1.00 being .034749.....	\$660,231.00
\$1,000,000.00 at 4 per cent for 20 years interest.....	800,000.00
Cost of loan, sinking fund method	\$1,460,231.00
Cost of loan, serial bond method	1,420,000.00
Difference in cost in favor of serial bond method .....	\$ 40,231.00

(Above tables prepared by Alfred D. Chandler, Boston.)

Insurance on Buildings and Equipment

Coincident with the reduction in the book value of school buildings and equipment in December, 1914, the Board of Education reduced the amount of insurance carried by \$311,580. Buildings and equipment are insured up to 80 per cent of their “sound value.” The total “sound value” of all school buildings and furniture and fixtures, as determined by the appraisers report of October, 1914, was as follows:

School buildings.....	\$3,197,650
Furniture and fixtures.....	256,150

The amount of insurance premiums paid each year for renewals, is between \$8,000 and \$9,000. Since School District Number One was consolidated in 1903, up to and including the fiscal year 1914-1915, the district has paid \$96,556 in premiums and received \$13,294 in fire losses. The school district, undoubt-

edly, has had protection from more serious losses to the extent of the amount of the policies carried, but it will be seen from the above figures that the premiums paid approximate \$7.25 to \$1.00 of losses. The point raised here is the question as to the desirability of establishing a fire insurance fund for the school district to supersede the present arrangement with private companies.

All policies in force, with the establishment of a fire insurance fund, would continue to run until they expired. They would not be renewed, but instead, each year, a certain sum would be credited to the insurance fund. The amount to be set aside each year to the credit of the insurance fund would be determined by the Board of Education or by experts employed for the purpose. The amount for rebuilding or replacement of property due to fire would be charged to the insurance fund.

The principle involved is not new. The school district simply assumes the risk and takes advantage of unused investment. The state of Minnesota passed an act establishing a fire insurance fund, which became effective August 1, 1913. All property of the state is insured under the provisions of this fund. The state commissioner of insurance determines the insurance value of each piece of public property and fixes the rate of premium which each department, board, etc., having state property in its control, shall pay into the fund, in accordance with the average rate charged by responsible fire and tornado insurance companies doing business in the state. Losses, also, are adjusted by the commissioner of insurance.

All policies in force at the time of the passage of the act, continued in force until they expired. This plan provides protection during the first years of establishing an insurance fund.

### **Service Records**

There are no records kept in the secretary's office, or elsewhere, showing the period of service, rates of pay, character of service, etc., of every employee in the Board of Education. Information was requested, in connection with this report, as to the year in which janitors and engineers, now on the payrolls, first entered the service of the Board, the schools in which they had worked, and the rates of pay they had received from the beginning of service. The only way this information could be obtained was by referring to payrolls dating back to the consolidation of schools in 1903.

There are over 10,300 payroll sheets covering the period from 1903 to 1916, inclusive (one payroll for each school each month). It was impossible, in the limited time of this report, to go through all those payrolls to get the information requested. Such information should be immediately available whenever needed. It would be a comparatively simple matter to keep a record with each employee in the administrative, operating, and maintenance departments, and enter therein any changes in position, rates of pay, etc. It would be very desirable, also to have in addition a system of efficiency ratings, particularly concerning janitors, engineers, and repair department employees.

The establishment of such records would merely be a recognition of the principle of rewarding merit and eliminating incompetent employees. In this connection, the supervising engineer states that one of the greatest problems of his department, in estimating the cost of a job, is the variation in the character and amount of similar work different mechanics turn out in a given time. The introduction of efficiency records should assist in remedying these conditions.

### **Supervisors as Clerks, Purchasing Agents, etc.**

Supervisors are appointed, presumably, because of their training and knowledge of the particular subject, or subjects, assigned to them to supervise and direct. It is poor policy and poor business to utilize any part of their time in clerical work, in keeping cost accounts, in purchasing supplies, in assisting in the work of issuing supplies from the storehouse, or performing duties which other persons are employed, or should be employed, specifically to perform.

The active assistance and co-operation of supervisors should be welcomed at any time by the business departments, but this assistance and co-operation should not be a burden on the supervisors or interfere unnecessarily with their legitimate duties. If any business department or organization unit is unable properly to perform its function or duties, the obstacle in the way should be removed rather than to meet the situation by imposing clerical duties on the supervisors.

Supervisors now keep records and accounts and have other duties which would not be required of them if the business departments were properly organized, and kept all the detail information of business transactions needed for efficient administration and operation. It is more economical to hire an extra clerk, if necessary, to keep needed records and accounts, than to shift the responsibility for such records and



information on supervisors and other heads of departments. The adoption of the changes in organization and methods, recommended in this report, would considerably improve conditions complained of in the foregoing.

### **Administrative Offices.**

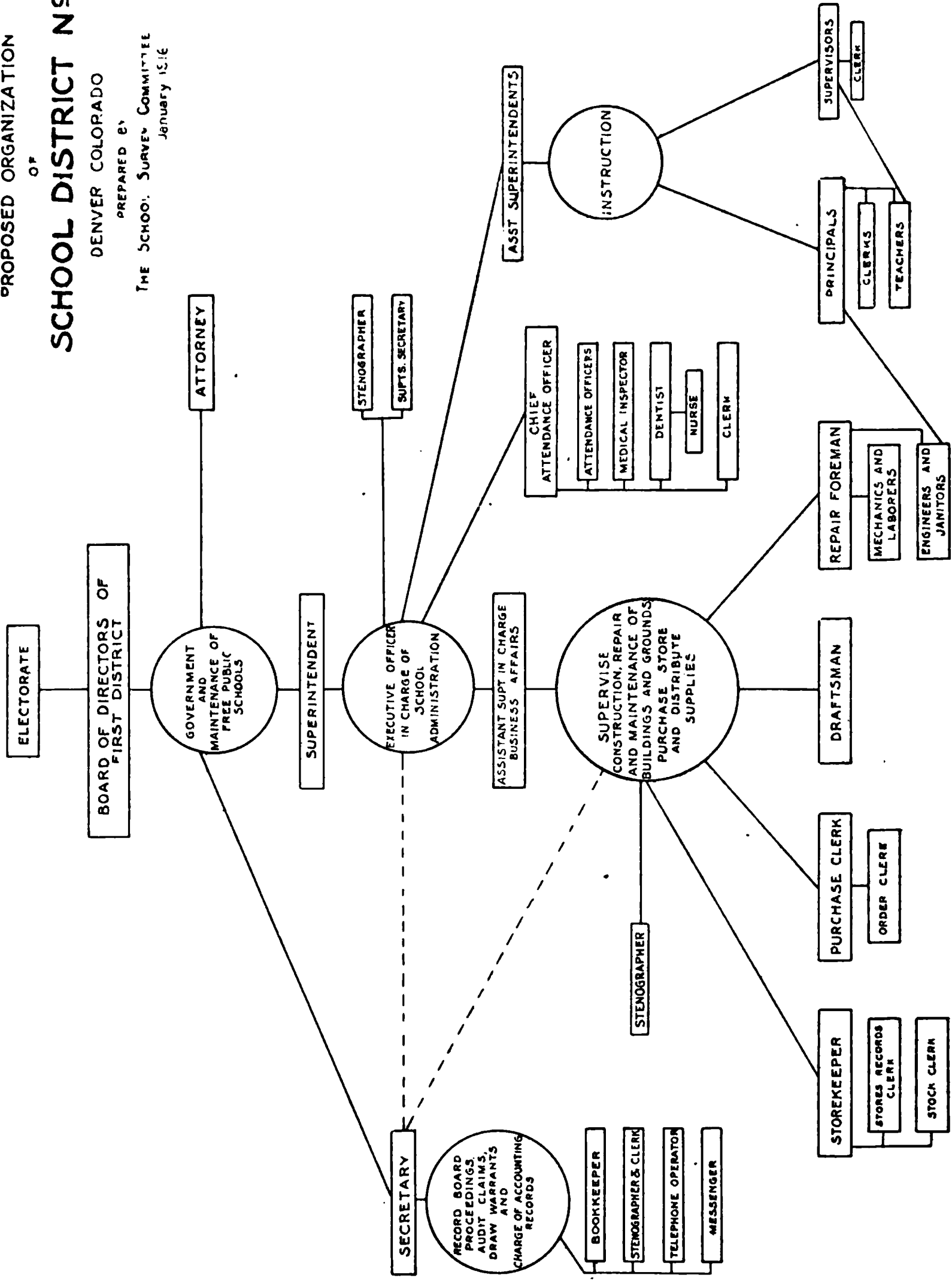
There is a very great need of an administrative building, or at least of a relocation of the business offices of the Board of Education. The present space occupied by the purchasing department, accounting department, and by the supervisors of domestic science and penmanship, in the basement of the East Side High School, is not only inadequate but unfit for office purposes. This is particularly true with respect to the offices of the supervisors of domestic science and penmanship. The light is poor and ventilation is very bad in the winter months.

The telephone exchange, which is unenclosed and shares the portion of the basement occupied by the accounting and purchasing departments, makes working conditions almost intolerable for the employees of those departments, when the exchange has a busy day, which is almost every day.

Under the present arrangement of office facilities, the superintendent of schools has only a small office off the secretary's office and board room on the first floor of the East Side High School. The vault in which the secretary keeps his records and papers can be reached only through the superintendent's office. This is inconvenient for both the secretary and the superintendent. The secretary is out of touch with the employees in the accounting and purchasing department in the basement, although he is required to supervise and direct their work. Two supervisors have their offices in a grade school some distance away from the East Side High School. The supervising engineer has his offices located in a private office building in another part of the city.

It would be difficult to plan a more unsatisfactory arrangement of the business offices of the Board of Education. It will be necessary to remedy this condition if the Board wishes to realize the advantages of centralized administration aside from considerations as to the value of good surroundings and working conditions for employees.

CHART OF  
PROPOSED ORGANIZATION  
OF  
SCHOOL DISTRICT No 1  
DENVER COLORADO  
PREPARED BY  
THE SCHOOL SURVEY COMMITTEE  
January 1916



LEGEND  
O Represents Functions  
□ Positions

# **REPORT OF THE SCHOOL SURVEY**

of

**School District Number One**

**In the City and County of**

**DENVER**

**Part V.**

**THE BUILDING SITUATION AND MEDICAL  
INSPECTION**

**By LEWIS M. TERMAN, Ph. D.**

**Leland Stanford Junior University**



**The School Survey Committee**

**Denver, Colorado**

**1916**



## TABLE OF CONTENTS

SCHOOL BUILDINGS AND GROUNDS—	Page
Introductory Statement .....	5
School Grounds .....	8
Lighting . . . . .	12
Basement Classrooms .....	21
Special Rooms .....	22
Improvised Classrooms .....	24
Portable Schoolhouses .....	25
Cloak Rooms .....	25
Seating . . . . .	26
Blackboards . . . . .	27
Heating and Ventilation.....	28
Toilets . . . . .	34
School Housekeeping .....	39
Drinking Fountains .....	41
School Baths .....	42
Janitors' Quarters .....	43
Fire Protection .....	44
Cost and Quality of Construction.....	45
Repairs . . . . .	46
The Superintendent of Buildings.....	46
School Planning .....	47
The High School Buildings.....	48
The Modernization of Old Buildings.....	50
 HEALTH WORK IN THE SCHOOLS—	
History and Purpose of School Health Work.....	53
What Denver Is Doing.....	55
What Other Cities Are Doing.....	56
Health Conditions Among Denver School Children.....	63
What the Above Questions Revealed.....	65
The Medical Examination of Teachers.....	71
Open-Air Schools . . . . .	71
Hygiene Teaching .....	72
Playground Instruction .....	72



# SCHOOL BUILDINGS AND GROUNDS

LEWIS M. Terman

Professor of Education, Stanford University.

## Introductory Statement

The report of school buildings and medical inspection will doubtless contain more adverse criticism than any other part of the survey report. If such is the case it should not be imputed to the preference of the critic but to the facts and conditions reported upon. Denver has relatively few school buildings erected later than fifteen years ago. The average age of its classrooms was computed and found to be a little more than 22 years. The following figure shows the number of classrooms (now in use) which were erected in each five-year period from 1875 to 1914, only classrooms below the high school being considered. It will be seen that more building took place in the five-year period 1890-94 than in any decade since.

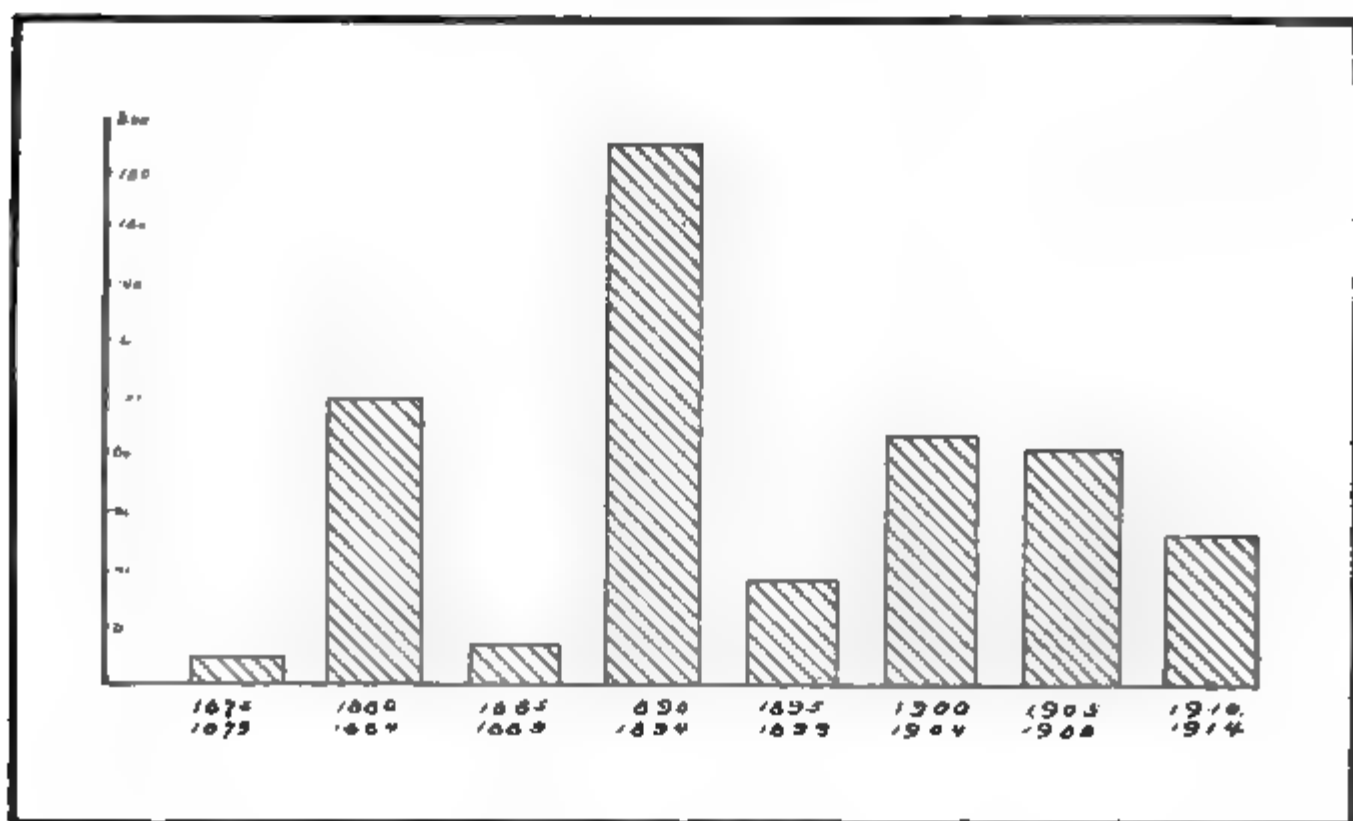


FIG. 1. Showing number of classrooms, still in use, which were erected in Denver each five-year period from 1875 to 1914.

It is easy to imagine how severely the curriculum and methods of instruction would have to be condemned if they belonged to the vintage of two decades ago. They would not in that case, however, be as far behind the standard of today as the average



school building of the same age. Nothing related to the school has shown more change in recent years than the standards of school house construction. The finest buildings of thirty years ago—buildings which people journeyed long distances to see—are now not only out of date architecturally, but are unhygienic and unsatisfactory for carrying on the work of the modern school. The Franklin School is a good illustration. When erected in 1883 it was considered almost an ideal school building. Although its walls are still firm, it is so unsatisfactory for school purposes as to warrant raising the question of its abandonment. The East Side High School is another illustration.

The criticisms which are to follow will probably come as a surprise to many intelligent citizens of Denver. The average person, however progressive and intelligent, can hardly be expected to be familiar with the technical standards in a subject like school architecture. He is, furthermore, likely to be misled by the fairly respectable exterior appearance presented by most of the Denver school buildings. They do not look dilapidated, but stand four-square, firm, and have not displeasing proportions. Some of the buildings which look good enough from the outside have long outlived their usefulness and should be replaced with the least possible delay.

Considering the city as a whole, few of the school rooms are well lighted; many of the heating systems are primitive; the ventilation is unsatisfactory in at least half of the buildings; dusty and parched air is carried into the classrooms; the toilets are usually dark, often cold, and sometimes foul-smelling. Some of the school buildings are surrounded by playgrounds hardly wider than an alley, and 80% of the school children have less than a reasonable amount of play room for a city of Denver's type.

One reason for the unsatisfactory conditions of school buildings has already been given: namely, the fact that so many were erected from twenty to thirty years ago. Another reason, less flattering to the early school authorities, is the fact that the buildings erected between 1890 and 1910 were, in many cases, ten years out of date at the time of their construction. This will be evident to any one who compares typical buildings erected during the above period in Denver with buildings erected at a corresponding period in a city like Cleveland, Ohio. Some of the eastern cities adopted unilateral lighting at least ten years before it became general in Denver. Even in the school buildings recently constructed the matter of orientation has been disregarded. Showers, swimming pools, nurses' rooms and other

necessities of the modern school building have hardly begun to find a place in this city. Any one who is familiar with the development of school architecture can see at a casual glance that the majority of all but the later buildings in Denver were planned by architects who, however capable along other lines, were unfamiliar with the best standards of the time as regards school architecture.

There is another factor which is in part responsible for the unsatisfactory conditions. Most of the buildings have been constructed piece-meal. No fewer than 22 buildings have received at least one addition, and several have had two or more additions. The striking fact in this connection is that the faults of the first section constructed have usually been, to a greater or less extent, repeated in the additions. In some cases, additions made as late as fifteen years after the construction of the first section have repeated every error in the old part. Cheltenham and Villa Park Schools illustrate this indefensible practice. The old part of Cheltenham was built in 1891, the new part in 1905, or fourteen years later. The new part is almost an exact duplicate of the old. Each has four rooms lighted on two sides, with narrow windows bunched near the center of the classroom walls. Villa Park was built in 1890 and 1906, but none of the progress which took place in school architecture during this sixteen years is suggested by the new part of the building. The new portion of Bromwell has classrooms 27x33 feet, also arched windows, to correspond with the part first constructed. Many of the worst planned school buildings in the city, as for example University Park, Vassar, and Milton, have been built with the evident intention of adding to them. Rather than to perpetuate the errors of such buildings it would be better to tear them down and begin over.

One characteristic of the school building of two decades ago was the preference given to symmetry, proportion and other items of exterior appearance, to the neglect of the convenience, comfort and health of the children. The school architect of that day, instead of banking the lighting area on one side of the room so as to give the proper distribution of light, punctured the walls at perfectly regular intervals with narrow windows, often arched at the top. Not knowing how to treat blank walls so as to rob them of their barrack-like appearance, he was careful to place as many windows on one side as another. The narrow rectangular plan of school building, which alone permits proper lighting of all classrooms, had not yet been thought of. Instead, square structures with either four or eight rooms on a floor were universal.

It is true that as regards most of the essentials Denver's newest school buildings are not bad. It may, therefore, appear unnecessary to dwell at length in this report on the shortcomings of the older structures. A plain-spoken and detailed exposition of these faults, however, must be given in order to show the necessity of replacing the older buildings by new ones more adapted to present school needs. The demands upon the taxpayers of Denver for this purpose will not be light, but the burden will be justified, however heavy.

## School Grounds

*Location of Sites.* A school site is well located when it is reasonably accessible to the children and when it is sufficiently distant from noisy factories, railroads, street cars, saloons, vicious resorts or other environmental nuisances. As far as the accessibility of the school buildings is concerned there seems to be little ground for complaint in Denver, except in the case of the Argo and Valverde Schools. The unsuitable location of the former is due to a special shifting of population which could hardly have been foreseen. It is desirable that in planning the location of future school buildings serious study be made of the drift of population in the various parts of the city. As far as possible future growth should be anticipated and ample plots of ground provided in advance of present need.

The present sites are in certain instances objectionable because of unsuitable environment. In the case of approximately 20% of the sites there is a car line within 100 feet of the school building. In many cases there are car lines on two or more sides of the school grounds. Besides the danger to which the children are exposed the noise of the passing cars disturbs the work of the school. Where it is possible to avoid it, a school should not be located within 200 feet of a street car line or within 500 feet of a railroad. At present, only half the school sites of Denver meet this requirement.

*Size of School Grounds.* Considering the fact that Denver has grown to its present size mainly within the last three or four decades, it is astonishing to find such a large proportion of cramped school grounds. In a very old city one expects to find schools without adequate playgrounds. In most western cities, whose main growth has occurred in recent years, we find a rather general recognition of the need of large school grounds. That thousands of school children in Denver should be deprived of room for wholesome recreation can only be explained by the short-sighted policy of her earlier school boards.

When is a school site large enough? The standard for the larger cities is rapidly coming to be 100 square feet of playground for each child enrolled. A city of the size of Denver should aim to provide in the neighborhood of 150 to 200 square feet per child. Some of the larger cities prescribe a minimum of 50 square feet per child. Table 1 and Figure 2 show what Denver provides.

**TABLE 1. SIZE OF PRESENT SCHOOL SITES.**  
**Group I. Less Than 100 Square Feet Per Child.**

	School	Enrollment	Sq. ft. per Child
1.	Ebert .....	560	4.1
2.	Valverde .....	225	17.9
3.	Whittier .....	1,000	18.2
4.	Bromwell .....	322	18.5
5.	Park Hill .....	498	18.6
6.	Vassar .....	125	23.6
7.	McKinley .....	677	25.1
8.	Webster .....	443	25.2
9.	Wyman . . . . .	580	25.8
10.	Montclair . . . . .	156	28.0
11.	Boulevard . . . . .	709	34.2
12.	Garfield .....	264	35.0
13.	Garden Place .....	900	35.5
14.	Elmwood .....	620	36.5
15.	Columbine . . . . .	578	36.9
16.	Hyde Park .....	574	38.3
17.	Fairmont . . . . .	415	38.5
18.	Sherman . . . . .	447	39.2
19.	Sheridan . . . . .	240	39.9
20.	Gilpin . . . . .	648	42.7
21.	Washington . . . . .	325	43.0
22.	Byers . . . . .	343	47.0
23.	Evans .....	675	47.4
24.	Central . . . . .	437	52.9
25.	Lincoln . . . . .	875	55.1
26.	Logan . . . . .	406	57.0
27.	Fairview . . . . .	300	62.2
28.	Emerson . . . . .	522	64.1
29.	Globeville . . . . .	152	65.0
30.	Cheltenham . . . . .	800	68.7
31.	Corona . . . . .	1,009	71.4
32.	Alcott . . . . .	1,012	72.1
33.	24th Street .....	213	76.2
34.	Villa Park .....	652	76.6
35.	Franklin .....	556	76.7
36.	Clayton .....	675	77.0
37.	Smedley .....	543	77.3
38.	Maria Mitchell .....	515	78.4
39.	Edison .....	631	81.3
Total .....		20,622	

**Group II. 100 to 116 Square Feet Per Pupil.**

	School	Enrollment	Sq. ft. per Child
1.	Ironton .....	150	102.5
2.	Ashland .....	1,000	114.4
3.	Swansea .....	504	115.4
4.	Columbian .....	560	116.0
Total Enrollment .....		2,214	

**Group III. 130 to 200 Square Feet Per Child.**

School	Enrollment	Sq. ft. per Child
1. Grant .....	365	133.9
2. Glen Park .....	75	156.0
3. Milton .....	177	179.3
4. Berkeley .....	300	200.0
Total Enrollment...	917	

**Group IV. Above 200 Square Feet Per Child.**

School	Enrollment	Sq. ft. per Child
1. Aaron Gove .....	395	271.3
2. Robert M. Steele.....	314	459.0
3. State Home .....	240	544.0
4. Myrtle Hill .....	220	663.6
5. University Park ...	127	963.9
6. New Barnum .....	85	2,560.0
Total Enrollment .....	1,381	

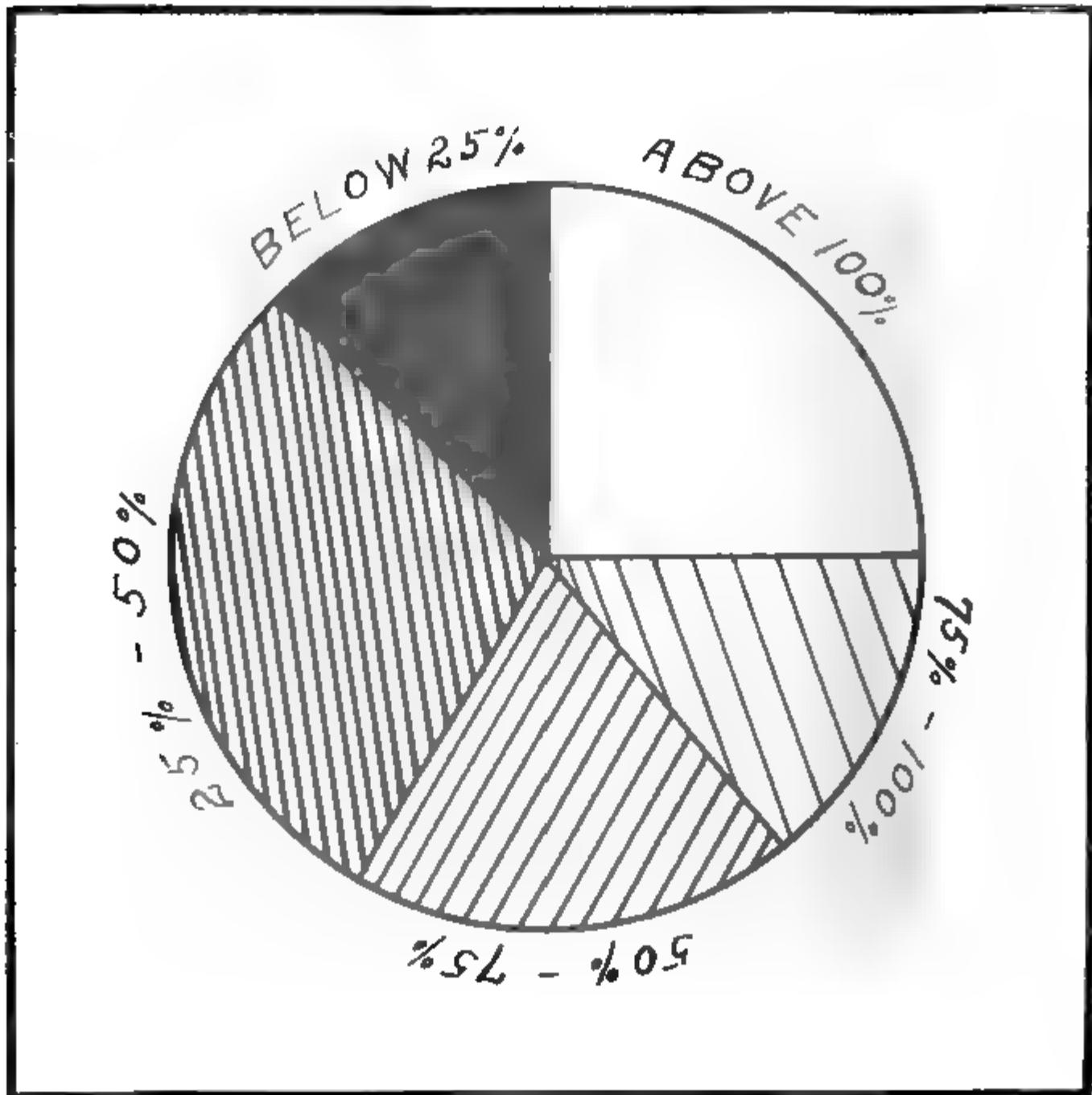


FIG. 2. Showing proportion of school sites of various percentages of sufficiency as regards size. Standard is 100 sq. ft. per child.

The foregoing data reveal a deplorable lack of play room. Ebert, for example, affords only four square feet of playground for each child! This is not even enough space in which to bury a dead child to say nothing of room for a live youngster to play. Nine schools, enrolling 4,430 pupils, have 25 square feet or less per child. Thirty-nine schools, enrolling 20,622 children, have less than 81 square feet per child. 11,000 children attend schools where the playground area is between 102 and 116 square feet per child. Only 2,298 children have a per capita playground area of more than 116 square feet.

Statistics of this kind have not been collected in many cities of the country. However, a comparison of Denver and Salt Lake City is interesting, since both belong to the same type of city. In Salt Lake City, approximately one-fourth of the children have a per capita playground area of less than 80 square feet; in Denver, approximately two-thirds of the school children are this badly provided for. In Salt Lake City, considerably more than one-fourth of the children have a per capita playground area of more than 200 square feet; in Denver the proportion is about one-thirtieth.

The inadequacy of the school grounds cannot be explained by the prices of real estate at the time they were provided. In a large majority of cases an unlimited amount of unimproved land was available at reasonable cost. Some of the buildings which are situated well toward the outskirts of the city were erected from 20 to 25 years ago, at a time when the supply of unimproved land was unlimited and the price inconsiderable. That large buildings should have been erected on plots of ground not much larger than the standard for a one-room country school is hard to explain except on the theory of persistent indifference regarding the welfare of the younger generation.

There is no other responsibility with which school boards are charged, the neglect of which, entails such serious consequences. When unfit teachers are employed, they can be discharged; when unsatisfactory courses of study are adopted, they can be revised; even when unhygienic school buildings are constructed, they can often be remodeled; but when a school house is erected on an inadequate site it is sometimes impossible to retrieve the error at anything less than a prohibitive cost. Adjacent lots are soon improved with expensive dwellings or store buildings and the price of real estate makes expansions costly and unlikely.

Fortunately, in the case of many of the inadequate school sites of Denver, it is still possible, to some extent, to make good



the deficiency. The following are some of the sites where additional room is badly needed and where it could still be secured at a reasonable expense: Alcott, Byers, Columbine, Emerson, Hyde Park, Logan, Maria Mitchell, Sherman, Smedley, Wyman and Fairview.

The above is by no means a complete list of the school grounds where expansion is feasible. It is urged that the board of education make a thorough canvass of the situation and, wherever it is possible to do so, that it take steps to remedy the neglect of earlier years.

*Condition of Grounds.* Considerably more attention could profitably be given to keeping the grounds in good condition. Of 55 grammar school sites from which data were secured, the drainage was said to be unsatisfactory in the case of 17 and only fair in the case of 11 others. Some of the grounds are practically useless during a part of the winter because of mud and pools of water. The following sites need grading or graveling, or both: Bryant, Fairview, Grant, Steele and Webster.

*Use of Playgrounds.* Little playground apparatus was in evidence, and in general it can be said that little thought seems to have been given to the educational possibilities of the playground. Cities are finding more and more that the playground, far from being merely a vacant place where children can be herded at recess and noon, is an educational asset hardly second in importance to the building itself. Before such advantages can be reaped, however, the school ground must be adequate in size, well equipped for play, and its activities must be carried on in a systematic manner as an integral part of the educational work.

Some criticism may also be made of the aesthetic treatment of school buildings and grounds. It is not recommended that the already diminutive playgrounds be turned into lawns or parks, for it is possible to bring about effective treatment without the use of much ground. Decorative shrubs, vines, and a very small lawn will sometimes give a pleasing effect to a school building which had formerly presented a forbidding appearance.

## Lighting

In general, the Denver schools are far from the standards as regards lighting conditions. The writer visited almost every classroom in the city without finding a single one which could be said to satisfy every one of the modern requirements. The following defects of lighting are all met with great frequency: insufficient window area, lighting from the wrong direction, ob-



structions near windows, unsuitable color treatment of walls and ceilings, opaque shades, and the improper use of shades. It will be necessary to discuss these factors separately.

*Amount of Light.* The amount of light entering a classroom depends both upon the area of the lighting surface and upon the points of the compass from which the light comes. Windows in sufficient number will not guarantee the proper amount of light unless they are correctly located. The height of the window, the size and shape of the classroom, and the color of the walls are all very important factors in school lighting. A classroom which is of the proper size and shape, with windows appropriately located and having walls and ceiling which reflect a large percentage of light, does not require a window area amounting to more than one-fifth of the floor area. In the Eastern states one-fourth is often preferred, Minnesota, New Jersey, Ohio, Pennsylvania, North Dakota, and Vermont have state requirements to this effect. In Denver, because of the brighter sky, one-fifth is quite sufficient, and one-sixth is fair.

In 689 classrooms in the grades, the ratio of window area to floor area was as follows:

In 170 rooms, or 24.6% of all, the ratio was below  $1/10$ —(intolerable).

In 391 rooms, or 56.7% of all, the ratio was between  $1/10$  and  $1/7$ —(very unsatisfactory).

In 105 rooms, or 15.3% of all, the ratio was between  $1/7$  and  $1/5$ —(fair to good).

In 23 rooms, or 3.3% of all, the ratio was  $1/5$  or above—(excellent).

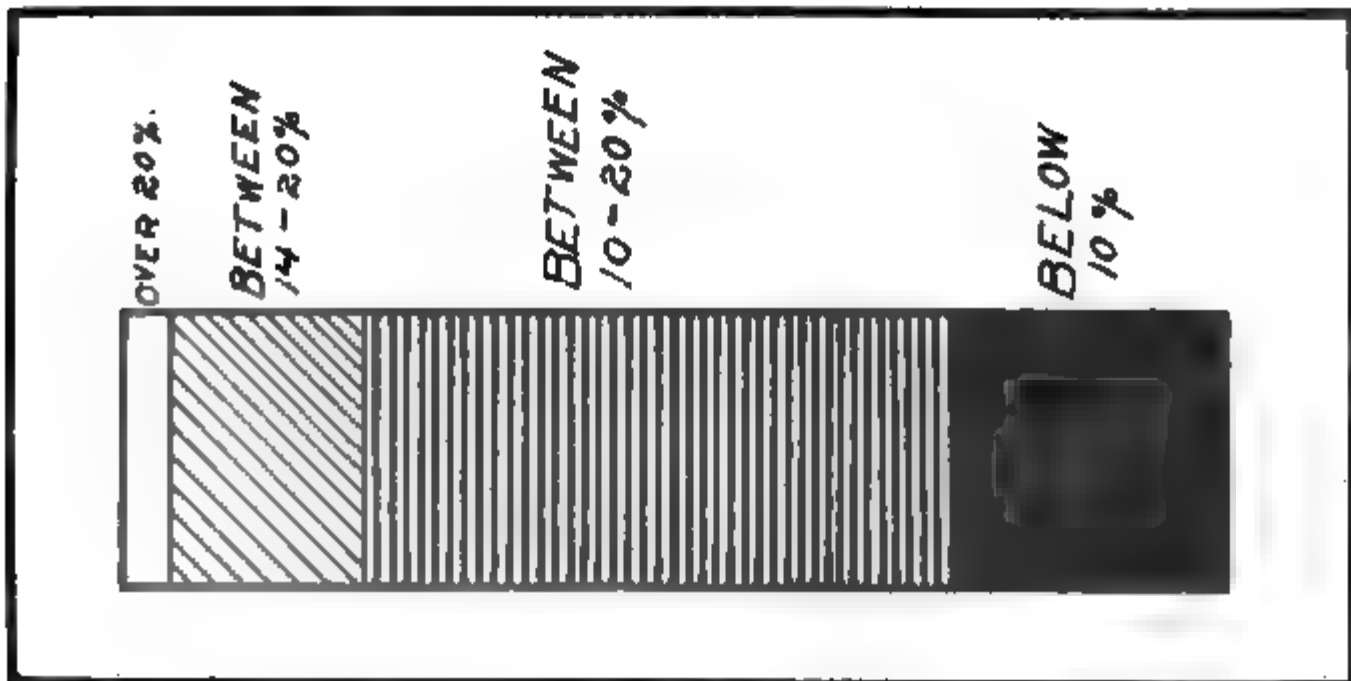


FIG. 3. Showing proportion of classrooms in Denver having various ratios of window area to floor area.

It is evident from the above figures that the lighting of classrooms in Denver is lamentably deficient. Fewer than 20% are even fairly well lighted. About one-fourth have such small window area as to be unfit for use. Fully 80% are below the standard of the most conservative requirement. The actual lighting is even worse than the figures alone indicate, for the reason that insufficient window area is nearly always associated with unsuitable location of windows, the presence of light obstructions, unsatisfactory shape of room, etc.

*Light Tests.* The results of 28 light tests are shown in the following table. It will be seen that many of the rooms tested, had, at the time of the test, an amount of light which was far below the minimum ever permissible. It will be noted, too, that these tests were all made in bright weather. In cloudy weather the light in these rooms is certainly less than half that indicated in the table. In making the tests the shades were left exactly as they were found. The Bishop Harman photometer was employed. This instrument is of English make and perhaps registers as accurately as any portable photometer which does not require an electric light.

TABLE NO. 2.

Showing Results of Light Tests on Darkest Desk of 28 Classrooms.

Name of School	No. of Room	Time of Day	Weather Conditions	Light in Foot Candles (Minimum Permissible is 9)
Ashland .....	6	10:00	Clear	2.0
Boulevard .....	18	11:00	Clear	4.0
Boulevard .....	17	10:50	Clear	2.5
Bryant .....	15	3:10	Clear	2.0
Bryant .....	6	3:25	Clear	1.5
Columbian .....	4	10:00	Clear	4.5
Corona .....	5	10:30	Clear	5.0
Corona .....	12	10:40	Clear	5.5
Ebert .....	6	10:30	Clear	6.0
Edison .....	Shop	9:30	Clear	4.5
Edison .....	15	9:40	Clear	4.0
Emerson .....	5	2:30	Clear	4.0
Franklin .....	3	2:40	Clear	2.5
Franklin .....	15	2:30	Clear	1.5
Gilpin .....	13	10:30	Clear	2—
Hyde Park .....	4	2:10	Clear	3.7
Hyde Park .....	5	2:20	Clear	6.0
Logan .....	7	3:30	Clear	2.5
Logan .....	4	3:40	Clear	2+
Maria Mitchell .....	11	11:30	Clear	3.5
Maria Mitchell .....	23	11:35	Clear	3.0
Vassar .....	S. W. on 1st	2:30	Clear	2.5
Washington .....	3	11:10	Clear	2.0
Whittier .....	25	11:00	Clear	3.0
Whittier .....	6	11:05	Clear	2.0
Whittier .....	Shop	11:10	Clear	1.5
Montclair .....	2	2:40	Clear	4.5

Only a few of the many badly lighted schoolrooms of Denver appear above. Had time been available for more tests several scores of such records could have been included in the table. Many of the rooms not tested were among the worst in the city. There are dozens as bad as any of the following:

1. First grade room in basement of the Cheltenham School; size 14x29; lighted only by two very small windows in one *end*; tops of windows extend only about 2½ feet above the grade level; ceiling only about 8 feet high.

2. Room 15 in basement of Columbine School; north light only; four half-windows all located near the *front* end of side wall; eleven feet of dead wall space behind the window farthest back.

3. Room 6, Bryant School; the three windows on the left are rendered useless by a high wall; practically all the light comes from two rear windows and there are trees just behind both of these and cutting off most of the light.

4. Recitation room, Valverde School; 6x19 feet; has no lighting area except the equivalent of a half window at one end; used by twenty children.

5. Typewriting room at South Side High School. 6x40 feet; no light except at one end; used by large classes.

According to the testimony of the teachers, there are 121 classrooms in the grades below the high school which need artificial light at least a part of the time. The number is really greater than this. Except in an occasional basement room, however, little attempt is made to utilize artificial lighting. It is urged that if the worst lighted rooms cannot be abandoned at once, they should at least be equipped with an indirect system of artificial lights.

*Light Obstructions.* Too little attention has been given to the utilization of the lighting area. Many rooms have enough windows but are poorly lighted because of adjacent walls or trees. In several cases, as, for example, at Corona, annex structures interfere with the lighting of certain rooms. Of 672 classrooms regarding which data were secured, 75, or 11%, had some obstruction within 20 feet of the room and extending as high as the tops of the windows. 142, or 21%, had such obstructions within 40 feet.

In order to avoid such obstructions it is especially important that the school grounds be not too small. Under no circumstances should the school building approach within 40 feet of an adjoining lot; a greater distance would be better. It is also important that the school building be planned in such a way

that extensions or additions may be made without detriment to the lighting of any of the rooms, old or new.

*Direction of Light.* For many years unilateral lighting of classrooms has been the rule universally accepted by competent authorities. In no other way can we be sure of the proper distribution of the light. Were it not for the fact that most pupils are right handed, it would not matter whether the light entered from the left or right; but if right-handed pupils are to be free from interfering shadows it is necessary that the windows be located in the left wall. Light from in front of the children does more harm than good, and is not to be tolerated. The effect is exactly analogous to that experienced when one faces an automobile light. The pupils of the eye contract, and one is in a certain degree blinded. Several states have laws forbidding light from the front. Light from the rear of the room is objectionable for two reasons: it is injurious to the teacher, and it causes the shadow of the child's body to be thrown upon the desk.

The following table shows significant facts with regard to the direction of the light:

Windows on the left only.....	373 rooms, or 58.4%
Windows on the left and rear.....	220 rooms, or 32.7%
Windows on the right only.....	6 rooms
Windows on the right and rear.....	35 rooms, or 5.2%
Windows on three sides.....	8 rooms
Windows on the front.....	12 rooms, or 1.4%
Windows on four sides.....	2 rooms
Windows on rear only.....	2 rooms

In all, 258 rooms or 38.3% are lighted partly by windows in the rear. This means that 258 teachers must, to a greater or less extent, face the light in carrying on their work. A few teachers avoid this, in part, by moving their desks to some other part of the room than the front. They can hardly be blamed for this, and yet it is a practice which is likely to make teaching less effective. Of 169 teachers who teach facing the light, 162 stated that they had experienced serious ill effects, the most common being eye strain, headache and nervousness. There are some 400 children in 12 classrooms who are subjected to this strain.

Lighting in the new buildings is unilateral. The older buildings might in many cases have their lighting greatly improved by cutting new windows and closing some of those most disadvantageously located.

*Orientation of Classrooms.* The rule is that all classrooms should be lighted either from the east or west. Although this rule is perhaps not as generally appreciated as certain other standards of schoolhouse construction, it is nevertheless one of

the most important of all. South light is particularly objectionable because it becomes necessary to cut off the direct rays of the sun by means of shades. As a rule these are kept drawn well toward the bottom of the windows during the greater part of the school day, with the result that the available light is insufficient in quantity and very badly distributed. While south rooms are likely to be agreeably warm in cold weather, they are disagreeably hot in the autumn or spring.

In Denver a north lighted room of the right shape and with a window ratio of 20% has enough light on all but the darkest days. North lighted rooms, however, are believed to be less healthful than rooms which receive the direct rays of the sun at least a part of the day. There are few people willing to live in a house which receives absolutely no sunlight, and it hardly seems reasonable to require children to attend school in such rooms.

While both north lighting and south lighting are objectionable as far as the ordinary classroom is concerned, either may be quite satisfactory for special rooms. Art rooms, manual training shops and store rooms may be located advantageously on the north side if care is taken to provide sufficient window area. The library, principal's office, rest rooms and kindergarten are well located on the south side of the building.

It is evident that east and west lighting of classrooms demands a special type of school building. The old-fashioned eight-room, square school building, the type to which so many of the Denver schools belong, makes correct lighting impossible. The building should be long and narrow, the long way extending north and south. This makes it possible to light all the classrooms either from the east or west. About one-third of the classrooms in Denver are lighted mainly from the north or south. Of nearly 100 south lighted rooms visited by the writer, not one was found with light conditions anywhere near satisfactory. This fault, unfortunately, is not confined to the older buildings. Two of the most recently constructed, Aaron Gove and Steele, were planned without any regard to the requirements of orientation. Six of the nine classrooms at Steele are lighted from the south, while at Aaron Gove the rooms are lighted from the north, east and south in equal numbers. Each of these buildings could just as well have been properly oriented, as far as the size and shape of the grounds are concerned. The policy of facing the building in such a way as to command the admiration of the passer-by rather than to further the activities of the school and to promote the health of the children cannot be too strongly condemned. When school authorities disregard the essentials of lighting in favor of unessential

externals the result is likely to be a half-century of headaches, eye-strain and ill health.

Other buildings incorrectly oriented are Byers, Evans, Myrtle Hill, Park Hill, and a number of others of earlier date. Park Hill is a good illustration of the danger of starting wrongly when a building is to be erected by successive additions. The old part was erected in 1903 and was given a north and south orientation. When in 1911 ten rooms were added, it was only natural that the original plan should be followed out. As a result, there are sixteen classrooms incorrectly lighted and some 600 children who suffer the consequences.

*Distance From Floor to Bottom of Windows.* In general, window area which is lower than three and one-half feet from the floor is more harmful than helpful. Only that light is effective which is reflected from the desk to the eyes. Light from too low down has much the same effect as that coming from the front of the room. On the other hand, if the windows are too high from the floor, say more than four feet, it is almost impossible to have adequate lighting area without windows on more than one side of the room. The following data from 561 rooms show the most common fault to be that of placing the windows too low:

281 rooms or 50% have windows from 35 to 44 inches from the floor.

195 rooms or 35% have windows lower than 35 inches from floor.

67 rooms or 12% have windows within 2½ feet of the floor.

28 rooms or 5% have windows within 2 feet of the floor.

85 rooms or 15% have windows which do not approach within 45 inches of the floor. This fault is common in kindergarten, shop and basement rooms.

*Position of Windows.* It is not sufficient merely to locate the windows in the left wall of the classroom. There is a proper and an improper way to locate them. Architects too often permit their location to be governed entirely by consideration of symmetry and external appearances. If the real purpose of school windows is to furnish suitable light for carrying on the work, then it is necessary to observe the following conditions: (1) There should be dead wall space of at least six or seven feet between the front wall and the window farthest forward; (2) The window farthest back should reach within a few inches of the rear wall; (3) The top of the windows should extend within a few inches of the ceiling; (4) The mullions between the windows should be not more than a few inches wide. In other words,



the windows should be banked, beginning about seven feet from the front wall, extending almost entirely to the rear wall, and reaching nearly to the ceiling. If the windows extend too far forward, some of the light strikes the children almost directly in the eyes. Wide mullions between the windows are objectionable, because they produce wedges of shadow.

All of these faults are extremely common in the school buildings of Denver, as the following data from 684 rooms will show:

208 rooms, or 30%, have windows within less than 4 feet of the front wall.

462 rooms, or 67%, have windows within 4 feet of the front wall.

100 rooms, or 14%, have windows from 6 to 8 feet from the front wall.

25 rooms, or 3.5%, have no windows closer than 10 feet from the front wall.

On the other hand, there are many classrooms whose windows are not located far enough toward the rear of the side walls. The following table shows the facts regarding 683 rooms:

218, or 32%, had no window within 3 feet of the rear wall.

269, or 39%, had no window within 4 feet of the rear wall.

113, or 16.5%, had no window within 6 feet of the rear wall.

66, or 9.6%, had no window within 8 feet of the rear wall.

Unnecessarily wide mullions are a still more common fault. Even the newer school buildings are unsatisfactory in this respect, having mullions from two to three feet in width. Many older buildings have blank wall spaces of six or eight feet between windows. By the use of steel mullions it is possible to reduce this useless space to only a few inches, and it is hard to understand why they have not been utilized in the newer buildings.

*Window Shades.* Approximately 60% of the shades in use are of dark green color. It would be much better if all were cream or light buff, because it would then be possible to shut out the direct rays of the sun without darkening the room so much. Other unsatisfactory colors occasionally found are dark tan and reddish brown. In 16 rooms Venetian blinds are in use. These are always unsatisfactory, because of the light streaks produced.

More important even than the color of the shades is their correct use, particularly in rooms lighted from the south. Even in classrooms where the window area was not more than half what it should have been, the shades were often found drawn in



such a way as to cut out from one-half to two-thirds of the light which would otherwise have been available. The correct use of shades is also important in rooms lighted from the east or west. Sometimes in an east lighted room, for example, the teacher draws the shades in the early part of the morning session to shut out the disturbing sunlight, and then forgets to raise the shades when the sun has moved away. Perhaps the more interested the teacher is in her work, the more likely she is to forget matters of this kind. Principals should exercise some oversight in this matter and keep the teachers reminded. Often the teacher has not considered the importance of the right regulation of window shades, and in such cases a word of caution is sufficient.

A few shades are torn or out of order. It would be well if the older and darker shades were replaced as rapidly as possible by new ones of suitable color.

*Basement Lighting.* As shown elsewhere, Denver has an unusually large proportion of basement classrooms. Most of these are very badly lighted. Ordinarily the window area is from one-half to one-third of the standard, and in some cases even less. The defective lighting is due largely to the fact that the basement ceilings are too low. Nearly two-thirds of the buildings have basement rooms in which the height of the ceilings is below ten feet. About one-third of the buildings have a basement ceiling less than nine feet high. Most of these basements are from three to four feet underground. It is evident, therefore, that each window is little more than a half window. Added to this is the fact that the basement rooms are usually very large and that the distribution of light, as well as the amount, is unsatisfactory. Many basement classrooms are hardly better than dungeons.

*Color of Walls.* The walls of the classrooms should be of light buff or cream color, not too far off the white. The ceilings should be very light cream or egg-shell white. Such colors reflect about 70% of the light and diffuse it equally throughout the room.

The color scheme in the Denver schools is the very worst the writer has ever seen; namely, a dark, dingy, blue-green. In some of the worst rooms the colors may be truthfully described as hideous. Such colors not only absorb most of the light and do a great injury to the eyes of the children, but in addition give a gloomy aspect to the school and have a depressing effect upon the mind. They would not be satisfactory even in rooms having ample window area, for the reason that they do not diffuse and distribute the light. In classrooms with inadequate lighting area dark colored walls are not to be tolerated. In many of the Den-

ver classrooms, the amount of available light could be about doubled merely by giving the walls and ceiling an appropriate color treatment.

In this connection we may raise the question as to the desirability of any uniform color scheme for interior walls. Some rooms are well supplied with windows, some poorly supplied. In certain cases the window area is so inadequate that the walls and ceilings should be almost white. In the best lighted rooms a little more color would be permissible. It should be emphasized, however, that in no case is there any danger of getting too much light in the room, provided the light is not direct sunlight, and provided further that it is properly distributed. Considering the relatively small expense which would be involved, the most important improvement which could be made in the lighting of the Denver schools which would be to re-tint a large majority of the classrooms and halls. It is urged that this be done at the earliest possible moment.

Owing to the use of obsolete types of heating plants in quite a number of the buildings, the walls of many of the classrooms are discolored with smoke and dirt. This condition will not exist when the older furnaces have been replaced and air washers have been installed. Air intakes should be located some distance above the ground, and well removed from dust centers.

*Lighting of Halls.* In a majority of the older buildings, the halls have far too little light. Sometimes they are so dark as to render fire drills more or less dangerous. In some, artificial lights are in use a great part of the time, and many which are not artificially lighted ought to be. Here again a suitable color scheme would greatly improve conditions.

### **Basement Classrooms**

More than 10% of the pupils enrolled in Denver attend underground schools. In all there are 131 basement classrooms in regular use. Although a few of these are not particularly objectionable, the large majority are unfit for classroom purposes. The underground rooms are nearly all badly lighted, some of them being little better than dungeons. Often the heating and ventilation are as unsatisfactory as the lighting. As a rule the ceilings are only eight or nine feet above the floor, a condition which makes satisfactory lighting impossible and greatly interferes with the ventilation.

The state laws of Minnesota, since 1909, have not permitted the erection of school buildings containing basement rooms designed for other purposes than domestic science, manual train-

ing, or physical culture. The law defines a basement room as one with the floor below the surface of the ground on all sides of the room. According to this law the domestic science room may be partly below grade line only if properly heated and ventilated, and if equipped with damp-proof floor. There is a state law in Ohio which prevents the erection of any room for purposes of instruction, with less than a ten-foot ceiling.

The above state regulations are along the right lines and set a worthy example for school officials throughout the country. It has been stated that basement rooms in Denver, owing to climatic and soil conditions, are less objectionable than in most other parts of the country. While there may be some ground for this belief, the fact remains that most of the basement classrooms in Denver are not, for one reason or another, fit for school purposes. No fewer than 18 of the entire number, attended by approximately 700 children, are reported by the principals to have damp floors or walls at least a part of the year. The peeling of the walls in quite a number of the rooms affords unmistakable evidence as to the unwholesomeness of their condition. Foul-smelling air and unsuitable temperatures were much oftener encountered in the basement rooms than elsewhere.

The worst of the basement rooms should be abandoned at once. Where there is no other solution, portable classrooms should be substituted. Plans should be made looking toward the abandonment, in the near future, of practically every basement room, with the exception of the better ones, which might still be used for manual training, domestic science, etc. Buildings later to be erected should contain no rooms below the ground level, and in all cases care should be exercised to make the ground floor damp-proof.

The question of basement rooms is more than one of health. They are attended usually by children in the kindergarten and first grade. Not only are children's bodies at this tender age easily injured by unwholesome conditions, but their minds as well are subject to the influence of impressions from without. The average basement classroom certainly does not give the young pupil a very cheerful introduction to education. The child's first experience with an institution outside the home ought to be such as would put him into right relations with the social world.

### Special Rooms

The modern school is in certain respects vastly different from the school of our fathers and grandfathers. When the

curriculum embraced little more than the "three Rs," the chief requirement of a school building was to furnish shelter and seats in which the children might study books. But people are demanding more and more of their schools. The curriculum has broken away from its old moorings, never to return. Shop work, domestic science and household arts, drawing, play and physical training are no longer fads, but indispensable phases of school instruction.

These demands, coupled with the broader use of the school plant for social center activities, make necessary a new type of school building; one having in addition to classrooms at least the following appointments: A shop, one or more rooms for domestic science and household arts, an assembly room with stage, a library, a nurse's room, a teachers' rest room, a sheltered play room or gymnasium, a store room, and a shower bath or swimming pool. In modern school planning the regular classrooms often represent considerably less than half the cost of the entire building.

Inasmuch as few of the Denver school buildings are of recent construction, it is not surprising to find that a majority lack many of these modern facilities. Of 56 grammar schools, only 11 have any assembly room, and several of these are unsatisfactory. Only 11 have a library room. There is not a single bath or nurse's room in the grammar schools of the city. Twenty-seven of the 56 schools have no store room, and 21 have no rest room for teachers or children. As stated elsewhere, the domestic science and shop work are often carried on in dark and ill-ventilated basement rooms.

Schools to be erected in the future should in all cases include a good-sized auditorium on the first floor, a library, a rest room for children and teachers, a store room conveniently located, a nurse's room, an art room, an open-air basement play room or gymnasium with nearby showers and dressing booths. The assembly room, the library, the gymnasium, the showers, and if possible, also one club room, should be located near together and should be so arranged that they could be opened for community use while the rest of the building remained closed.

With proper economy in the planning of buildings, it is possible to secure these advantages without greatly increasing the cost of construction above that represented by the Gove and Steele schools. For example, even in the more recently constructed buildings, much space has been wasted in classrooms and hallways. Unnecessarily large classrooms are not only wasteful, but objectionable in other respects. They favor the

enlargement of classes beyond the point where effective instruction is possible, make heating and ventilation expensive, and render discipline more difficult. From every point of view, the classroom with a floor area of 22x29 feet and a ceiling height of 12½ feet is preferable to one 27x34 feet with a 14 foot ceiling. The cubical contents of the latter are 61% greater than the former. This represents an excess in first cost of not far from 40%, to say nothing of the difference in cost of heating and ventilation. The hundreds of thousands of dollars wasted on large classrooms and monstrous halls would have gone far to equip the schools of Denver with the special rooms and appliances demanded by the requirements of the modern school.

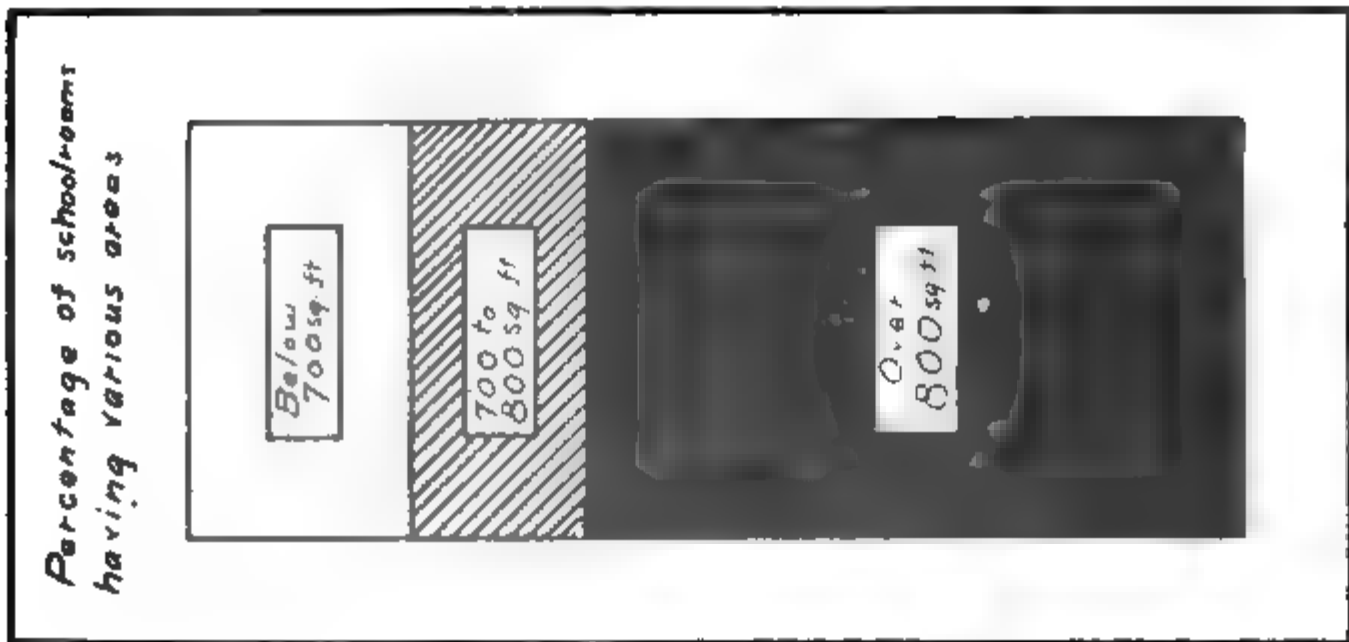


FIG. 4. Proportion of classrooms having various areas.

### Improvised Classrooms

Some 33 improvised classrooms were found in the grades below the high school. Many of these are cloakrooms, hallways, or library rooms, nearly all of which are extremely objectionable as regards heating, lighting and ventilation. Such rooms should be regarded as temporary expedients, and in most cases should be abandoned at the earliest possible moment. In a number of states their use would be illegal.

The following are only a few of the many illustrations which might have been given of unsatisfactory improvised classrooms:

Room 13 at Smedley: 15x28 feet, lighted by two windows on one end.

Emerson has a classroom improvised from a cloakroom 9x15 feet; also another nearly as bad.

Logan has a cloakroom 5x24 feet used as a recitation room for 20 children. This room has only one window at the end and no ventilation. The temperature was 75 degrees.

Room 19, Boulevard: 9x18 feet, two small windows at one end. Is used by 16 children.

Valverde: a room 6x19 feet, having the equivalent of a half window at one end.

### **Portable School Houses**

Some eight of the portable school houses are in use in various parts of the city, and have proved by no means unsatisfactory for emergency purposes. In fact, they are incomparably more hygienic than most of the basement rooms, and are more satisfactory than hundreds of other classrooms in the city. The lighting is usually not bad, and the ventilation is better than in many of the older buildings. Perhaps the worst objection to the portable school is that it is likely to be uncomfortably warm in the early fall and late spring, and to have a cold floor in winter. On the whole, however, their condition is such that parents should infinitely prefer them to many of the regular schoolrooms of the city. Their number could well be increased considerably, pending the inauguration of an extensive building plan.

### **Cloak Rooms**

Cloak rooms are not found in any of the newer buildings, and the few scattered about in the older buildings fail, in most cases, to meet the requirements as regards location, size, ventilation and lighting. Most of them are located at the wrong end of the room, are much larger than necessary, and are badly lighted. Most of the buildings erected in the last fifteen years have dispensed with cloak rooms in favor of racks located along the side or down the middle of the halls. In this way the halls are rendered unsightly, and, in a few cases, made too narrow for the convenience of the children in moving to and from classrooms. This arrangement also leaves the children's wraps less protected than they would be in properly constructed cloak rooms.

The cloak room should be located off the classroom, just behind the teacher's desk. It should be connected with the classroom by a door near each end, but should have no direct connection with the hall. This arrangement gives the teacher easy control of the cloak room and minimizes the danger of pilfering and other nuisances. The cloak room should have one window of



good size and should be ventilated through the doors connecting with the classroom. The currents of air can be so directed that, after circulating through the cloakroom, the foul air is forced out without again entering the classroom.

Certain types of closets have been devised which make it possible to dispense with cloak rooms, while at the same time avoiding the use of the unsightly racks such as now disfigure the halls in so many of the Denver schools. Closets of this kind are equipped with a special form of ventilation which keeps the wraps in wholesome condition. It is questionable, however, whether this device is more satisfactory on the whole than the kind of cloak room above recommended.

### Seating

The seating arrangements practically throughout the Denver schools are unsatisfactory. Adjustable desks and seats, so common in the better cities of the country, are here conspicuous for their absence. Of approximately 600 classrooms below the high school, only 69 contained any adjustable desks—the total number of desks being 1,231. In other words, only about one Denver school child in twenty-five is assured of a seat which fits him. It is true that adjustable seats of standard type cost a little more than the obsolete models; but where the health of children is involved, slight differences in cost should not determine the purchase. As a matter of fact, if the desks are not adjustable it is inevitable that a large proportion of the children will be improperly seated and that physical deformities and ill health will be fostered. Almost every classroom contains children who differ several years in age and from 12 to 18 inches in height. In three rooms where measurements were taken the tallest child was found to be 15, 16½ and 17½ inches, respectively, taller than the shortest child in the same room.

It should be emphasized, however, that adjustable desks are of no especial advantage unless they are actually adjusted to fit the children who use them. Such adjustments should be made at the very least twice each year. According to the testimony of the teachers, the desks in 12% of the rooms were adjusted between October, 1915, and February, 1916; 11% had not been adjusted for one year; 32% had remained unadjusted for from one to three years; and 37% were said never to have been adjusted.

Where adjustable desks are not available, there should at least be three sizes of ordinary desks in each room. About 60% of the rooms, however, had only one size of desk, and about 30% two sizes.





grade. In order to provide for this contingency, it would be well to place no blackboards higher than 30 inches.

Heating and Ventilation

In only two school buildings of the city can the heating and ventilation be regarded as satisfactory in all respects. These are the Aaron Gove grammar school and the North Side High School. In about 40% of the buildings the heating and ventilation seemed to be satisfactory with the exception of some minor fault. In the remaining schools, the conditions range all the way from fair to extremely unsatisfactory.

*Heating.* Five buildings are heated entirely by stoves, and stoves are frequently used for supplementary heating in basement rooms of other buildings. Twenty-one buildings, or more than one-third of all, are heated by old-fashioned hot-air furnaces.

The most important test of the efficiency of the heating plant is the actual temperature recorded in the classrooms at various times in the day. All the teachers in the city, below the high school, were asked to make such records at ten o'clock and again at two o'clock on Thursday, February 24th. In order that the records might represent ordinary conditions, the request was not sent to the teachers until shortly before the time when the observations were to be made. The outside temperature on the day in question ranged between 30 and 60 degrees. The following table shows the temperatures recorded.

TABLE 4  
CLASSROOM TEMPERATURES

10 A. M.		2. P M.	
Temperature	Rooms	Temperature	Rooms
60	0	60	1
61	6	61	3
62	6	62	2
63	1	63	7
64	3	64	5
65	9	65	3
66	28	66	31
67	3	67	1
68	165	68	172
69	96	69	94
70	168	70	163
71	53	71	57
72	57	72	61
73	21	73	76
74	27	74	7
75	12	75	9
76	3	76	8
77	5	77	3
78	2	78	1
79	3	79	0
80	1	80	0

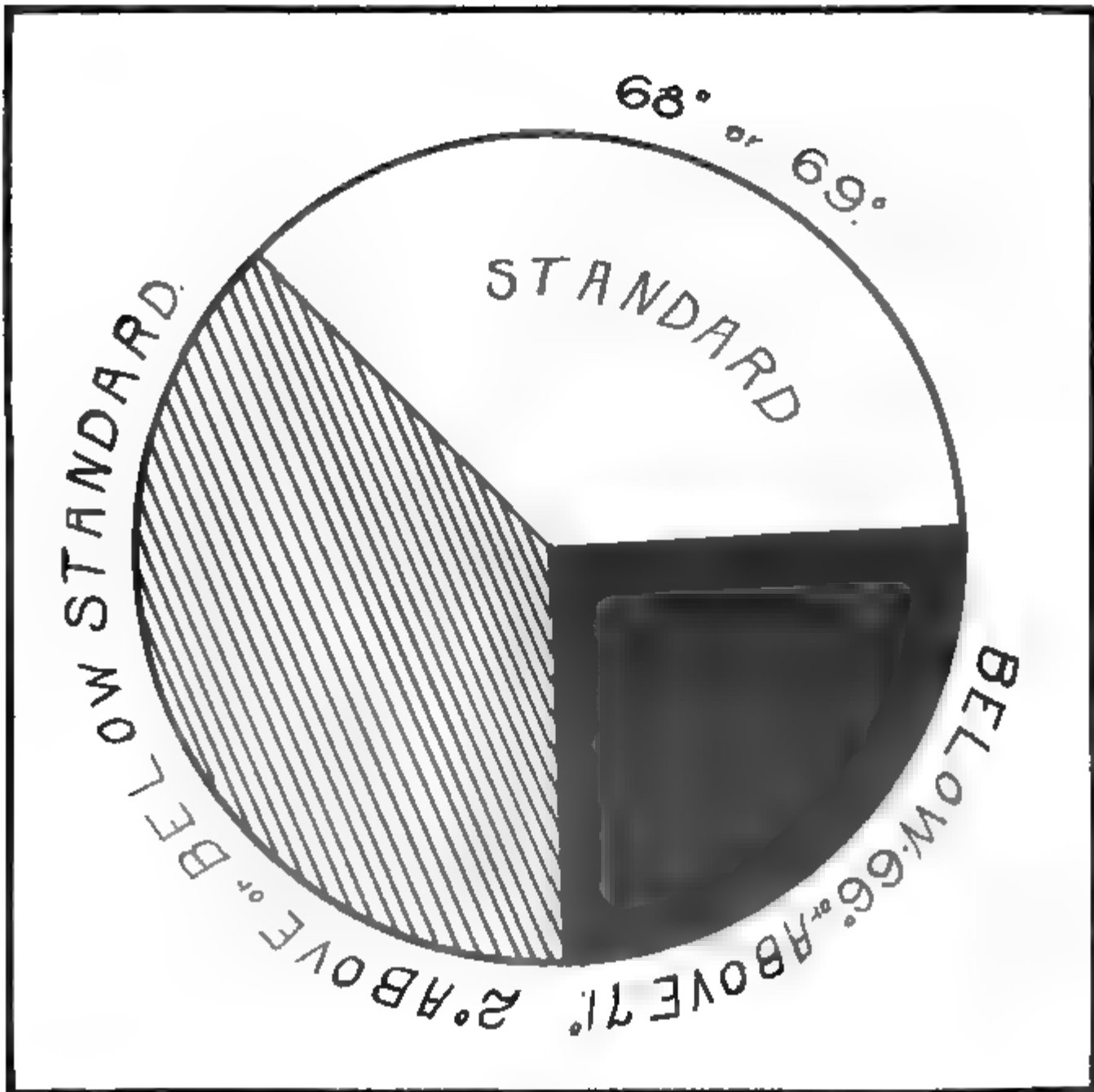


FIG. 5. Proportion of classrooms having various temperatures.

Such a range of temperature can only be explained as due to the defectiveness of the heating plant or to the inefficiency of the janitors, or both. If we consider as satisfactory the temperature 68 to 69 degrees, it is found that 57% of the records show a temperature too high, and 7% a temperature too low. On a more liberal basis, we may regard the range from 66 degrees to 71 degrees as standard, in which case we find 26% of the records too high and 4% too low. The most common fault, and the most serious one, is that of keeping the room too warm. If the records above can be accepted as representative, then approximately 5½% of the school children of Denver are daily subjected to the suffocating temperature of 74 degrees or above.

It is generally believed that temperatures a few degrees below 68 are less injurious than those a few degrees above this point. In fact, if air is driven into the room at the proper degree

of humidity, a temperature of 64 to 68 degrees is not uncomfortable and is perhaps much more healthful than higher temperatures.

These temperature conditions are the inevitable result of the defective heating and ventilating systems in many of the buildings. With a plant like that in Aaron Gove and certain other buildings it is possible to keep the temperature of practically every part of the building at any desired point, provided the janitor is able and willing to give the expert supervision which every modern heating plant requires.

As recommended elsewhere, more attention should be given to the heating of the toilets. Heat and ventilation should be provided as soon as possible in the toilets of the following buildings: Berkeley, Bromwell, Central, Columbian, Fairview, Grant, Montclair, Swansea, and University Park.

Special attention should also be given to the heating of halls and basement rooms. The halls at Gilpin, for example, are very cold. Those basement rooms which give serious trouble as regards heating, as well as those badly lighted, should be abandoned at once.

*Ventilation.* Ventilation and heating are inextricably bound up together. As indicated above, optimum temperature varies according to the kind of ventilation supplied. Conversely, the amount of fresh air needed and the physiological effects of the fresh air both depend in large measure upon the temperature at which it is supplied. The children themselves are another variable factor. Children who stand or walk about in a shop or domestic science room get along more comfortably in a temperature of 66 degrees than children who are sitting quietly in their seats.

The most serious difficulty encountered in any attempt to appraise a system of school ventilation comes from the fact that the older ideas on the subject have been generally abandoned and that disagreements still exist in regard to the newer principles advocated. A few years ago, the ventilation of buildings was considered purely a mechanical problem—a problem which was thought to be solved whenever the ventilating engineer succeeded in supplying thirty cubic feet of fresh air per minute per child, at a temperature of 68 to 70 degrees, and without perceptible currents. With a modern system of mechanical ventilation, it is possible, with a little care, to satisfy all the above requirements. This is being done in a few of the school buildings of Denver.

Recent and epoch-making investigations, however, such as

those of Dr. Leonard Hill and the New York Commission on Ventilation, as well as experiments with open-air schools, have thrown grave doubt upon the validity of the older principles and standards of ventilation. It seems to have been demonstrated that neither the most extreme deficiency of oxygen nor the most extreme excess of carbon-dioxide ever found in any schoolroom is in itself injurious. Moreover, the search for toxins supposedly exhaled from the lungs of the children has so far revealed no danger from this source. On the other hand, the important factors seem to be temperature, humidity, and air currents. Experiments have repeatedly shown that temperatures much above 68 or 70 degrees are badly borne by the subject under experiment. The most common immediate effects are headaches, a feeling of malaise, and nervousness. The atmospheric conditions around the body have a very close relationship to the internal regulation of body heat. The human body is equipped with a complicated and delicate physiological mechanism which controls the rapidity of heat formation in the body, and the rapidity of the body's heat loss. These heat regulating processes are found to work best when: (1) the temperature of the surrounding air is not too high, say not above 68 to 70 degrees; (2) when the relative humidity of the air is about 40 degrees to 60 degrees; (3) when the body is bathed in perceptible air currents; and (4) when the body is allowed to experience occasional changes of temperature.

It is because the open-air schools supply the above conditions that they have proved so beneficial to the semi-invalid children who attend them. In the open-air school the temperature is kept between 40 and 60 degrees when possible; the humidity is satisfactory for the reason that the air has not been overheated; and instead of "protecting" the child from all perceptible movements of air, gentle currents of cool air are freely allowed to enter the room. It is a universal experience that sickly children who attend schools of this type improve marvelously in weight, appetite, and number of red blood corpuscles.

Such facts suggest strongly that the ends for which ventilation engineers have striven in the past are likely to be abandoned, or at least modified. While it is still too early to lay down the principles which are to guide the ventilating engineer of the future, it is safe to predict that the ends to be solved will be those suggested above: namely, moderate temperature, good humidity, ample air currents, and occasional change of temperature. It is also too early to forecast in detail the modifications which will take place in the mechanical methods of attaining the

above ends. There are many who believe that the most expensive and mechanically perfect system of ventilation is inferior from the point of view of physiological effects, to ordinary window ventilation.

Whatever the ideal system of ventilation may ultimately prove to be, there are in this city certain faults of heating and ventilation which cannot be disputed. The facts already set forth regarding temperatures show how much room there is for improvement in this direction. Still more serious, doubtless, is the neglect to humidify the air. As everyone knows, air which is heated loses enormously in per cent of relative humidity. When the cold outside air is heated and driven into the classroom its capacity to absorb moisture is vastly increased. Such air is abnormally dry and parched. It absorbs every particle of moisture available, not only from the furniture and walls, but also from the nose, throat and skin of the children. Those subjected to overheated and parched air tend to develop disorders of the nose and throat and to suffer other ill effects not yet fully understood. In all the Denver schoolrooms, with the exception of two buildings, the air of the classrooms was found to be as dry as that of the Sahara desert.

This is shown by 26 humidity tests made in various buildings, all of which gave records of 15 to 21 per cent of relative humidity, with the exception of Aaron Gove, where the record was 57. This demonstrates the efficiency of the humidifying apparatus used in the Gove School.

It should be emphasized that the conditions reported above are found in all the schools with the exception of the Aaron Gove and North Side High. Additional tests in any number would have given approximately the same results. The principles involved are unvarying. Given a certain outside temperature and outside humidity, then heat this air to another given temperature without adding any moisture, and the resulting degree of humidity may be known without test.

The low humidity shown in the above table is as unnecessary as it is injurious. Those buildings whose system of heating and ventilation are in other respects modern could be supplied with humidifiers at very small cost. In fact, an actual saving would result, for the reason that when the proper degree of humidity is maintained the temperature required in the classrooms need not be as high as would otherwise be necessary. At the Aaron Gove school the classrooms are fully as comfortable at 66 degrees as those of other school buildings at 70 or 72 degrees. It is evident, therefore, that in the course of a few months



the saving of fuel would defray the cost of installing the humidifier. Another argument in favor of humidifiers is the fact that the air now supplied in classrooms is often dusty. The same apparatus which humidifies the air also frees it of millions of dust particles.

Time was not available for making tests to determine the amount of fresh air supplied to the classrooms. This much, however, is evident: that a large portion of the ventilating systems belong to a type that cannot possibly afford the degree of ventilation intended. No gravity system ever installed has proved satisfactory. The amount of fresh air supplied by the gravity system depends upon the difference between the temperature of the outside air and that of the indoor air. Only in cold weather will enough fresh air be supplied. When the difference between the indoor and outdoor temperature is not great, the amount of interchange is greatly reduced. The only satisfactory way of insuring a proper supply of fresh air in a classroom not of the open-air type, is to force it in by means of fans.

But merely to get enough fresh air into the room is not sufficient. It should enter at the right temperature and should be rightly distributed. One of the worst objections to the hot air furnace is the fact that it so often supplies air that has been overheated.

In order to bring about the right distribution of air as it enters the room, the inlet and outlet must be properly located with reference to each other and with reference to the shape of the room and the location of outside walls. It is unnecessary here to set forth the standards as regards these many particulars. It is sufficient to call attention to the fact that one or more of the generally accepted rules are transgressed in all but the most recently constructed buildings. One common fault is the improper location of the fresh air inlet in the classroom. The proper distance from the floor is about eight feet, but as is shown in Table 6, many of the inlets are located within three or four feet of the floor. When this is the case, the outlet is also improperly located and the distribution of the air in the classroom is certain to be unsatisfactory. In some of the older buildings the inlets are set in the floor. Inlets so placed become receptacles for dust and dirt, which is blown into the schoolroom and breathed into the lungs of the children.



TABLE 6.  
HEIGHT WARM AIR INLETS

48 rooms	0 to 1 ft.
16 rooms	1 to 4 ft.
87 rooms	5 to 6 ft.
260 rooms	7 to 8 ft.
9 rooms	9 or over

420 rooms reported.

The air intake for the buildings is also improperly located. In more than half the cases the fresh air is taken from near the ground level, often from dusty playgrounds and streets. The result is very bad.

Mention has elsewhere been made of the unsatisfactory ventilation of the toilets. It is hoped that outside toilets will be as rapidly as possible abandoned in favor of light and well ventilated quarters in the basement. The ventilation should be out through the service chambers and should be constant.

## Toilets

Taking the city as a whole the school toilets are about the worst the writer has ever seen. Only in a minority of the school buildings is the plumbing reasonably modern. In many cases it is unsanitary. Six schools are provided only with dry vaults which are a disgrace to the city. In the large majority the the lighting and ventilation are extremely unsatisfactory. The common custom has been to make the toilet a separate structure from the main school building, with the result that it is not convenient of access, is uncomfortably cold, and difficult properly to oversee.

The following table and figure show a large number of deplorable facts regarding the insufficient lighting and inadequate seats and urinal space in many toilets.

TABLE 7.

Showing Insufficient Accommodations and Lighting of Toilets in 55 Grammar Schools.

Name of School.	Boys per seat (Standard, 25)	Per cent. Sufficiency.	Boys per Urinal (Standard, 10 boys per ft.)	Per cent. Sufficiency.	Girls per seat (Standard, 15)	Per cent. Sufficiency.	Light Ratio, Boys' Toilet	Per cent. Sufficiency.	Light Ratio, Girls' Toilet.	Per cent. Sufficiency.
Aaron Gove	14	178	13	75	7	214	$\frac{1}{20}$	83	$\frac{1}{13}$	87
Alcott	42	59	42	24	42	35	$\frac{1}{20}$	25	$\frac{1}{13}$	30
Ashland	50	50	31	32	38	39	$\frac{1}{13}$	26	$\frac{1}{13}$	30
Berkley	15	167	9	111	15	100	$\frac{1}{20}$	20	$\frac{1}{13}$	10
Boulevard	25	100	24	42	13	115	$\frac{1}{20}$	83	$\frac{1}{13}$	83
Bromwell	13	192	9	111	15	100	$\frac{1}{14}$	36	$\frac{1}{10}$	26
Bryant	23	107	12	83	25	60	$\frac{1}{10}$	50	$\frac{1}{13}$	36
Byers	43	58	9	111	22	68	$\frac{1}{20}$	25	$\frac{1}{20}$	25
Central	31	81	18	56	15	100	$\frac{1}{10}$	50	$\frac{1}{13}$	7
Cheltenham	29	86	33	33	15	100	$\frac{1}{10}$	26	$\frac{1}{13}$	32
Clayton	42	59	10	100	24	62	$\frac{1}{11}$	45	$\frac{1}{13}$	38
Columbian	28	89	20	25	20	75	$\frac{1}{17}$	30	$\frac{1}{17}$	30
Columbine	29	86	32	34	21	72	$\frac{1}{8}$	100	$\frac{1}{8}$	83
Corona	23	107	14	72	19	79	$\frac{1}{20}$	25	$\frac{1}{20}$	25
Ebert	40	62	10	100	22	68	$\frac{1}{13}$	38	$\frac{1}{10}$	50
Edison	39	65	21	48	31	48	$\frac{1}{28}$	20	$\frac{1}{14}$	63
Elmwood	26	95	8	125	13	115	$\frac{1}{10}$	71	$\frac{1}{10}$	71
Emerson	37	67	15	67	37	41	$\frac{1}{10}$	50	$\frac{1}{10}$	50
Evans	24	104	10	100	37	41	$\frac{1}{14}$	61	$\frac{1}{14}$	61
Fairmount	21	118	10	100	12	125	$\frac{1}{14}$	61	$\frac{1}{14}$	61
Fairview	21	118	10	100	12	125	$\frac{1}{14}$	61	$\frac{1}{14}$	61
Fleming	25	100	19	53	15	100	$\frac{1}{18}$	27	$\frac{1}{10}$	26
Fleming	23	107	14	72	15	100	$\frac{1}{17}$	30	$\frac{1}{13}$	38
Franklin	23	107	14	72	18	83	$\frac{1}{20}$	25	$\frac{1}{13}$	15
Franklin	31	81	23	43	16	94	$\frac{1}{17}$	30	$\frac{1}{17}$	30
Garden Place	30	83	18	56	32	47	$\frac{1}{17}$	30	$\frac{1}{10}$	26
Garfield	15	167	8	125	15	100	$\frac{1}{10}$	50	$\frac{1}{10}$	50
Gilpin	27	93	10	100	20	75	$\frac{1}{10}$	71	$\frac{1}{10}$	71
Glen Park	13	192	0	0	13	115	$\frac{1}{10}$	71	$\frac{1}{10}$	71
Globeville	13	192	0	0	13	115	$\frac{1}{10}$	71	$\frac{1}{10}$	71
Grant	25	100	10	100	25	60				
Grant	18	138	16	62	13	115	$\frac{1}{25}$	20	$\frac{1}{25}$	20
Hyde Park	24	104	12	83	24	62	$\frac{1}{25}$	20	$\frac{1}{13}$	27
Ironton	13	192	7	143	13	115	$\frac{1}{10}$	50	$\frac{1}{11}$	49
Lincoln	31	81	29	34	24	62	$\frac{1}{34}$	15	$\frac{1}{10}$	55
Logan	21	118	10	100	20	75	$\frac{1}{20}$	25	$\frac{1}{10}$	26
Maria Mitchell	24	104	10	100	20	75	$\frac{1}{20}$	25	$\frac{1}{10}$	26
McKinley	24	104	10	100	17	92	$\frac{1}{14}$	36	$\frac{1}{17}$	30
McKinley	34	73	17	59	18	90				
Milton	22	114	11	91	18	90	$\frac{1}{33}$	15	$\frac{1}{33}$	15
Myrtle Hill	37	67	18	56	22	68	$\frac{1}{20}$	25	$\frac{1}{15}$	33
Montclair	13	192	10	100	18	90	$\frac{1}{20}$	25	$\frac{1}{15}$	33
New Barnum	9	267	11	90	8	188	$\frac{1}{14}$	61	$\frac{1}{14}$	61
Park Hill	21	118	25	40	9	164	$\frac{1}{100}$	5	$\frac{1}{100}$	5
Robert W. Steele	22	113	9	111	18	90	$\frac{1}{10}$	83	$\frac{1}{10}$	71
Sheridan	22	113	9	111	17	92	$\frac{1}{14}$	36	$\frac{1}{17}$	25
Sherman	12	208	6	167	8	188	$\frac{1}{10}$	50	$\frac{1}{10}$	25
Sherman	23	107	13	75	25	60	$\frac{1}{10}$	50	$\frac{1}{10}$	25
Smedley	27	93	20	50	17	92	$\frac{1}{15}$	7	$\frac{1}{18}$	27
State Home	27	93	20	50	17	92	$\frac{1}{20}$	25	$\frac{1}{20}$	25
Swansea	30	79	20	50	60	25	$\frac{1}{20}$	71	$\frac{1}{20}$	71
Swansea	32	37	12	83	23	65	$\frac{1}{14}$	36	$\frac{1}{14}$	17
24th Street	9	267	8	125	9	164	$\frac{1}{14}$	36	$\frac{1}{14}$	17
University Park	32	37	8	125	21	72	$\frac{1}{14}$	36	$\frac{1}{14}$	17
Valverde	16	156	16	62	14	107				
Vassar	21	118	13	75	13	115	$\frac{1}{10}$	25	$\frac{1}{10}$	25
Villa Park	23	107	18	56	23	65	$\frac{1}{20}$	25	$\frac{1}{20}$	25
Washington	27	93	8	125	13	115	$\frac{1}{13}$	38	$\frac{1}{13}$	16
Webster	22	113	15	67	22	68	$\frac{1}{17}$	30	$\frac{1}{17}$	33
Whittier	33	35	8	125	16	94	$\frac{1}{28}$	20	$\frac{1}{28}$	33
Wyman	17	147	10	100	17	92	$\frac{1}{10}$	13	$\frac{1}{10}$	14
Wyman	17	147	10	100	17	92	$\frac{1}{17}$	30	$\frac{1}{17}$	26

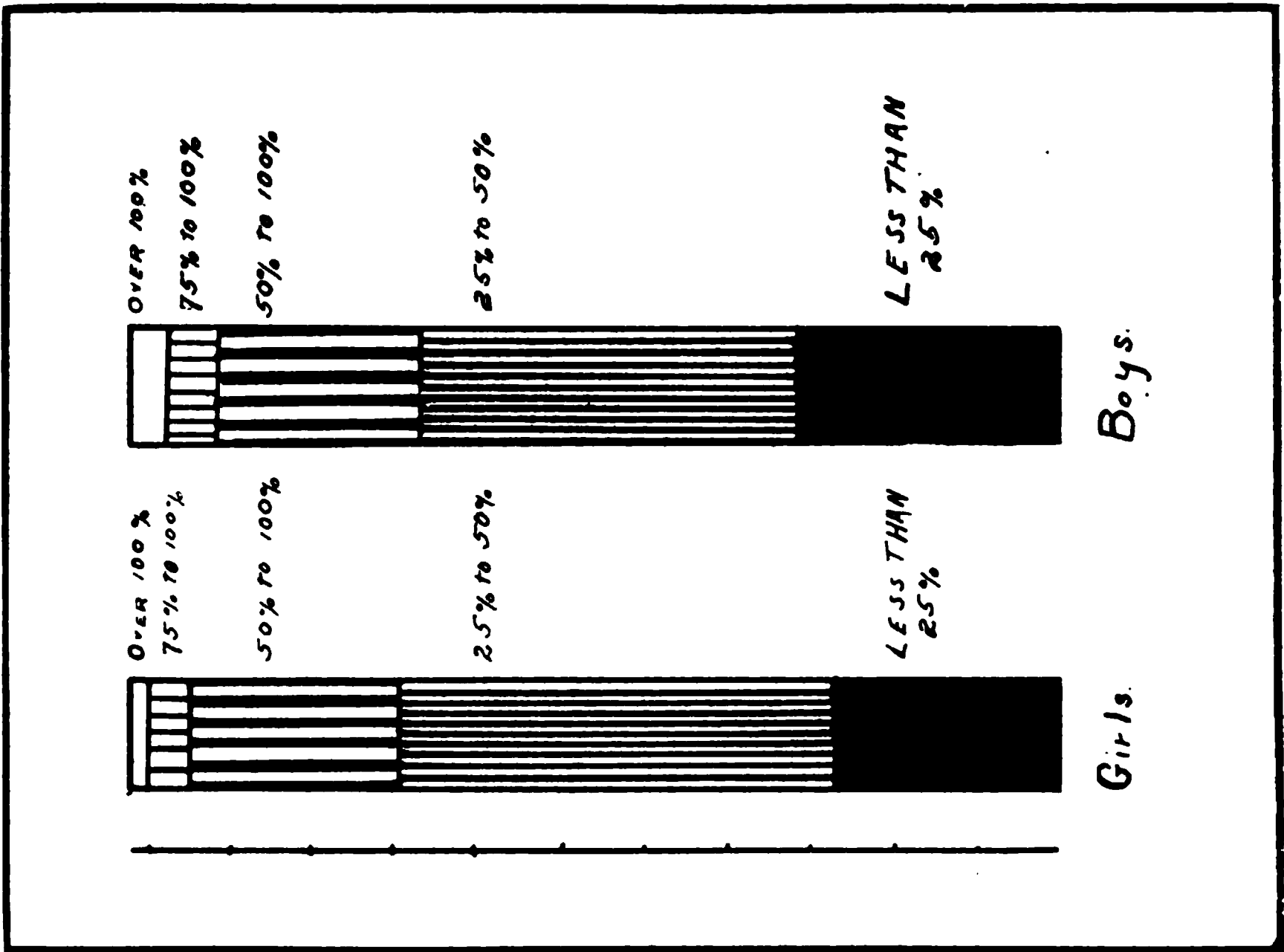


FIG. 6. Showing percentage of sufficiency of window area for toilets.

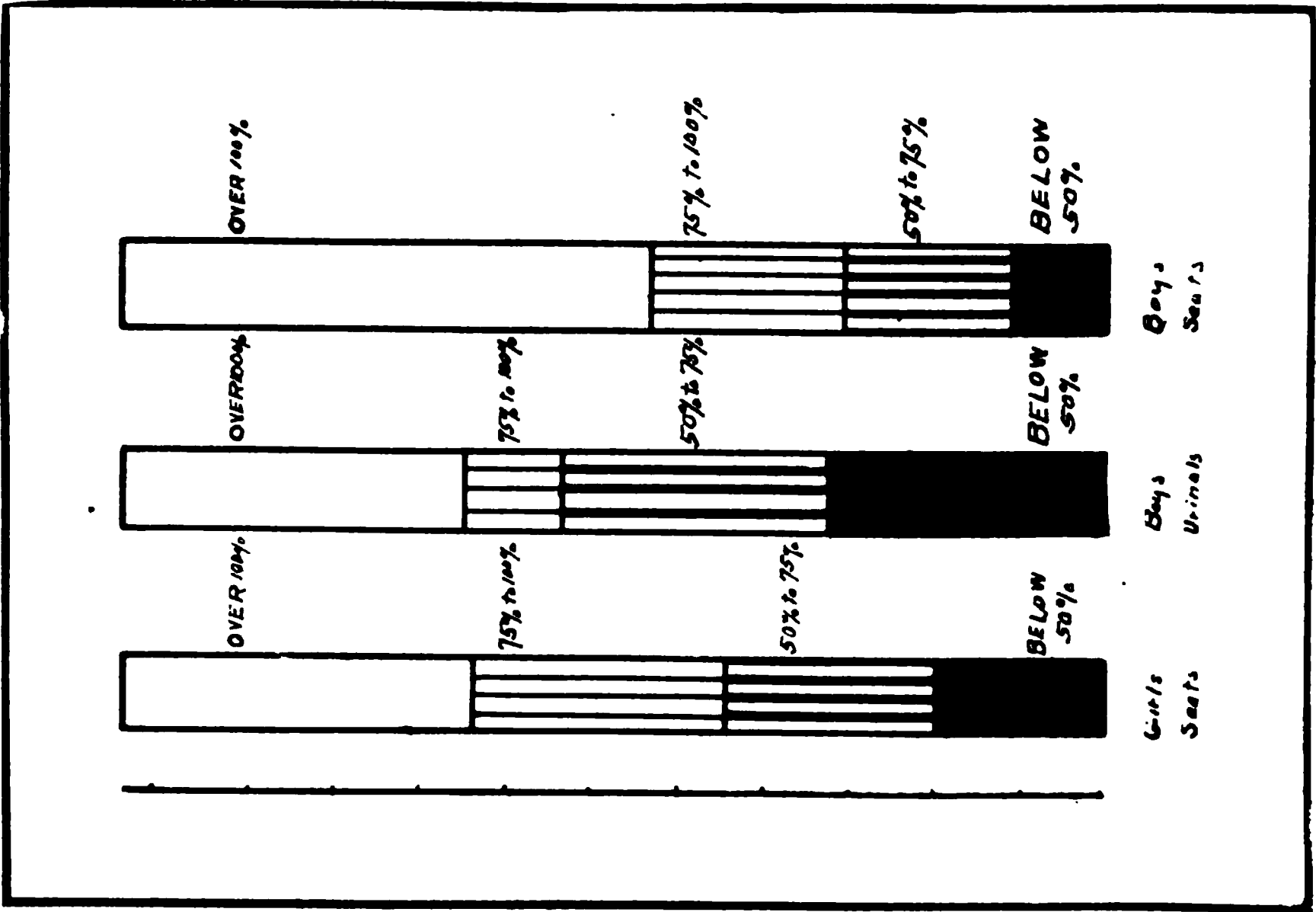


FIG. 7. Showing percentage of sufficiency of toilet seats and urinals.

The standard is one seat for 15 girls; one seat for 25 boys; and one foot of wall urinal for 10 boys. It will be observed that as regards number of seats for boys, the Whittier, Swansea and University Park Schools have little more than one-third the standard number; that Ashland, Byers, Alcott and Clayton have only 50% to 60% enough, and that Ebert, Edison, Emerson, McKinley and Myrtle Hill have a deficiency of 40 to 20%.

As regards amount of urinal space, Alcott and Ashland have below 35% the requisite amount, while Boulevard, Cheltenham, Columbian, Columbine, Edison, Franklin, Lincoln, Park Hill and Smedley all have a deficiency of more than 50%.

Alcott and Ashland have little more than a third of the requisite number of seats for girls, Edison, Emerson and Garden Place have but one-half enough, while Bryant, Byers, Clayton, Globeville, Hyde Park, Lincoln, Milton, Sherman and Webster are all from 30% to 50% below standard.

It is evident that in the planning of toilets there has been little consideration given to standard requirements. Among the various schools we find all the way from 4 to 50 boys per seat and from 6 to 42 girls per seat!

The standards as regard lighting have been even more neglected. One finds the ratio of lighting area to floor space varying all the way between  $1/100$  and  $1/5$ , with all sorts of values represented between these two extremes. In the main, the toilets are woefully dark. In some the seats are hardly visible at all. The majority have less than one-half of the requisite lighting area and about one-fourth have less than 25% of what they should have. Some of the darkest toilet dungeons are found at Ebert, Emerson, Swansea, Twenty-fourth Street and Whittier. Many others are little better than these. Failure to light toilets adequately cannot be too strongly condemned. There is no other room in a school building, not even the classroom, in which inadequate lighting is as objectionable.

Dry vaults are found at the following schools: Barnum, New Barnum, Fleming, Glenn Park, Globeville and Valverde. Such toilets are inexcusable in a city like Denver and should not be tolerated.

Other toilets which are in need of remodeling because of the unsanitary plumbing or because of inadequate heating, lighting or ventilation are found at the following buildings: Argo, Ashland, Bryant, Byers (ventilation), Central, Columbian, Clayton (ventilation), Corona (one building), Ebert, Broadway High, Edison, Elmwood, Fairmont, Franklin, Garden Place, Garfield, Gilpin, Grant, Hyde Park, Logan, Longfellow, Mitchell, Milton,

Sheridan, Sherman, Washington, Whittier, Wyman, East High, Manual High, South High, West High.

In many cases the ventilation of the toilets is either lacking altogether or is extremely defective, and about a third have little or no heating. This comes largely from the location of toilets in separate structures. There is no excuse for such an arrangement. Considerations of health, as well as comfort, require that toilets be ample in number, conveniently located, and equipped for comfort.

More attention should be given to the floors and drainage of the toilets. The toilets at Cheltenham and Villa Park have floors which slope in the wrong direction and cannot be flushed out. The resulting condition is intolerable. In many cases the floors are of wood, though more often of concrete. Great effort should be put forth to make the floors of toilets moisture-proof. In some states there are laws requiring all floor within 4 or 6 feet of the urinal to be made of asphalt or other strictly non-absorbent material.

Toilet facilities should be provided for teachers. At the Bryant school for example, there is no separate toilet for the 19 teachers except a single seat located in the girls' toilet. This condition is by no means uncommon and is one that should be remedied at an early date.

One of the most serious criticisms remains. In half or more of the toilets no facilities are provided for washing the hands. This was often true even in toilets where running water had been provided. Because the children were sometimes inclined to splash the water about or to be neglectful about turning it off janitors have frequently cut off the water supply of the wash-basins permanently. Liquid soap and paper napkins were not found in a single grammar school building. These should be looked upon as necessities, not as luxuries. It seems almost incredible that in these days of hygiene and sanitation some 35,000 children should be systematically trained not to wash the hands on leaving the toilet. This is what it amounts to when washing facilities are not provided.

A still more incredible situation was found in two schools: namely, the failure to furnish any toilet paper. The janitor and principal at each of these buildings admitted that there had been no toilet paper supplied during the present year, the explanation being that "children were so wasteful of it." Words are too weak to express the appropriate condemnation of such disgusting economy.

In buildings later to be constructed, toilets should be provided with individual porcelain bowls, flushed automatically by means of a spring seat; ventilation should be provided through the service chambers; and floors should be moisture-proof and properly graded. Cement floors are not moisture-proof and their use should be abandoned. The stalls in the girls' toilets should be screened. There should be separate, well ventilated toilets with small seats for the kindergarten children. In general the toilets should be located in the basement with east, south or west exposure, preferably south. The window area should be in no case less than one-tenth the floor area and should be greater if possible. The seats should be arranged along the wall instead of in double rows which cut off the light. An emergency toilet for boys and another for girls should be located on each floor.

### **School Housekeeping**

The janitorial service, in so far as it could be judged by one brief visit to each building, appeared to be about as good as that of the average city, though it was of very uneven quality. Six or eight buildings showed evidences of decidedly superior intelligence and industry on the part of the janitors. On the other hand, fully as many bore the evidence of janitorial neglect and inefficiency. The following figure shows how frequently, in the various buildings, the floors are oiled and scrubbed, the windows washed, and the classrooms swept with sweeping compound.

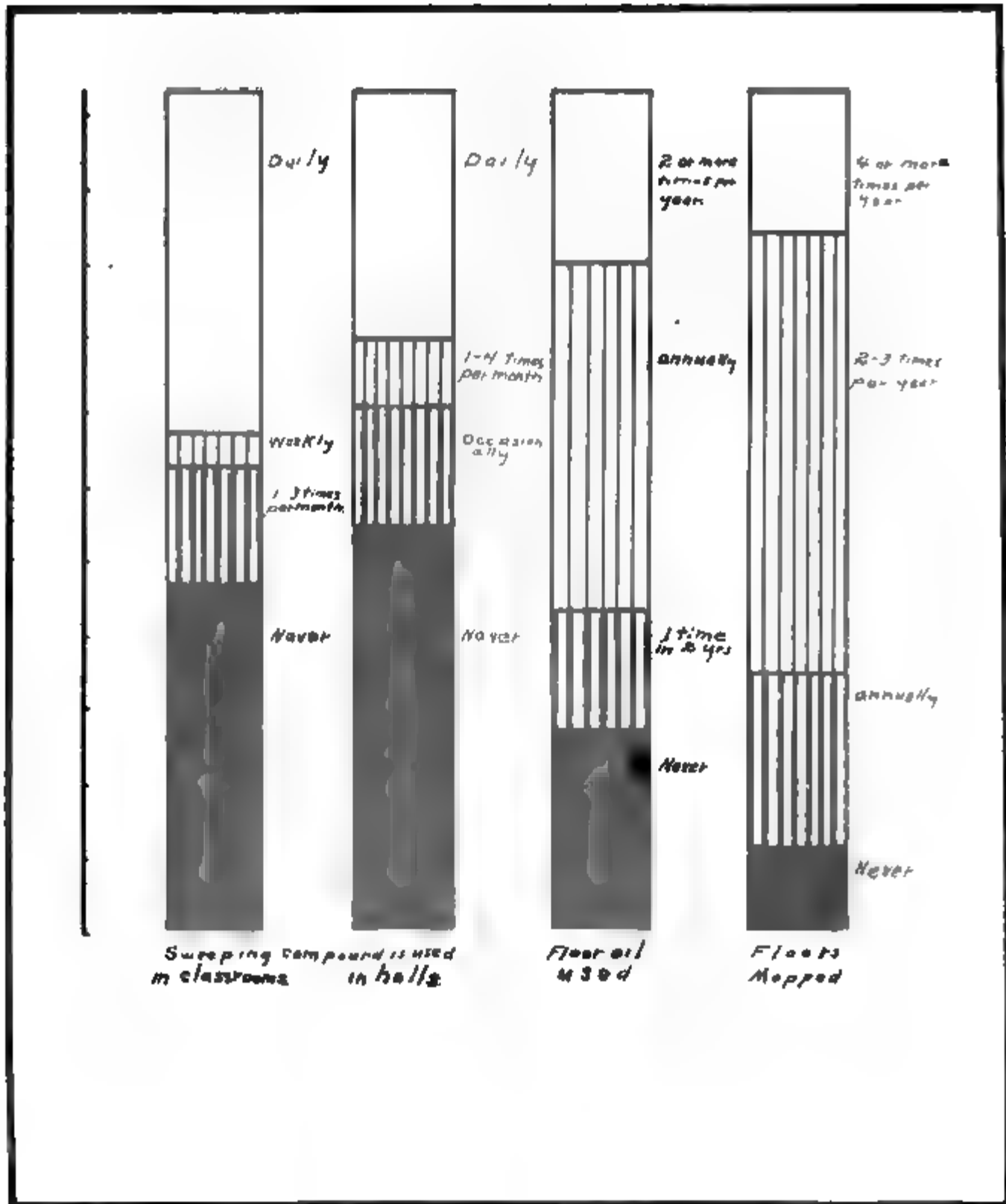


FIG. 8. Showing frequency of various housekeeping methods in the Denver Schools.

Among the most important facts brought out in the above table are the following:

(1) Of 56 grammar schools, six have never had the floors oiled, ten have had an application only once in from two to several years, 28 once a year, and 12 as often as twice a year. It is now generally recognized that the floor should be oiled at least twice, if not three times per year. Experiments have demonstrated that when oil is applied this often, and in the right manner, the amount of free dust in the school room is reduced to a small fraction of what it otherwise would be. It is true



that teachers sometimes object to floor oils on account of the soiling of skirts. When the oil is properly applied, however, this objection does not hold. The floors should first be mopped clean and allowed to dry thoroughly; then a very light coat of hot oil should be spread, after which all that has not been absorbed should be mopped up. Treated in this way, floors are neither unsightly nor slippery, and the wearing qualities are improved. The most important argument, however, is the enormous reduction in the number of dust particles breathed by the children.

(2) The table shows that most of the school buildings are mopped two or three times a year, only eleven as seldom as once a year, and only one not at all. This is not bad. Three times a year is perhaps often enough to wash the floors, provided it is each time done thoroughly.

(3) The use of sweeping compound has been very generally neglected. In twenty-eight buildings it is not used in the classrooms oftener than twice a month, and in 21 buildings it is never used in the halls. It seems to be a prevailing belief that if the floor has been oiled the use of the sweeping compound is unnecessary. In reality, sweeping compound reduces the number of dust particles so greatly as to justify its daily use both in halls and classrooms.

(4) The table shows that the windows are washed with commendable frequency in most schools; in 47, three or more times per year; in six, twice a year, and in one annually.

(5) It is surprising to find that the medieval feather duster still holds sway in some of the school buildings of a progressive city. According to the testimony of the principals, the feather duster is used to some extent in eleven schools, and in one exclusively. In some states this pernicious method of dusting is prevented by law, and surely it is unnecessary to argue here for its abandonment in Denver.

The most effective method of removing the dust is by the use of the vacuum cleaner. At present, only one school building in Denver—the North Side High School—is equipped for this purpose. The janitor at this building finds the vacuum cleaner highly satisfactory, as indeed it always is when properly installed. All new buildings to be erected in the future should have vacuum cleaners.

### **Drinking Fountains**

All the schools are supplied with a certain number of drinking fountains. The model is of old style and is not satisfactory because the water flows out in such a way that it is difficult to

drink without touching the lips to the bowl. As an experiment the drinking of 53 children in various schools was observed. One-third of these placed the lips against the metal. It goes without saying that drinking fountains used in this way are little more hygienic than common drinking cups. Something could no doubt be done by teaching the children how to use them.

As shown in the following table, no standard seems to have been operative in apportioning the drinking fountains among the schools.

**TABLE 8**  
**DRINKING FOUNTAINS PROVIDED**

Less than 25 children per fountain .....	3 schools
Between 25 and 50 children per fountain .....	12 schools
Between 50 and 75 children per fountain .....	22 schools
Between 75 and 100 children per fountain .....	5 schools
Between 100 and 125 children per fountain .....	2 schools
Between 125 and 150 children per fountain .....	5 schools
Between 150 and 200 children per fountain .....	2 schools
Over 200 children per fountain .....	3 schools

There should be one jet for about 50 pupils, or at most one for 75 pupils. Of the 54 grammar schools represented in the above table, 17 have an inadequate supply of drinking fountains. There are 10 schools which enroll more than 125 children for each jet. It is only reasonable that if drinking fountains are to be supplied at all they should be apportioned according to some standard.

The location of fountains has, in most cases, been satisfactory. It is always well to have some in the playground and some in the building; preferably one or more jets on each floor. Besides lessening the danger of contagious disease, drinking fountains are also valuable in that they cause children to drink more water than they otherwise would. They should be so numerous and so conveniently located as to act as a constant temptation to copious drinking.

### School Baths

School baths are rapidly becoming a standard requirement in school-house construction. In the beginning they were recommended merely for the benefit of the children who had no opportunity to bathe at home, and the requiring of children to use them was a frequent source of humiliation and friction. It was soon found, however, that showers appeal to the children of all social classes. Many prefer the school shower to the home tub and so bathe more frequently than they otherwise would do. This is especially the case when the school has an

ample playground and promotes its use by play instruction. Every much-used playground should, as a matter of course, have nearby showers or swimming pool. The swimming pool is greatly to be preferred but is much more costly to install and maintain. Much of such additional expense is warranted, since the swimming pool performs a greater service than showers. It not only affords baths, but furnishes also excellent exercise and trains children in the useful art of swimming.

Both swimming pools and showers are desirable as a means of encouraging the wider use of the school plant, and, under certain conditions and at certain times, they should be thrown open for community use. From an economic point of view it is unreasonable that school plants, costing altogether millions of dollars, should be in use only five or six hours per day. Their more extensive utilization is not only supported by economical considerations, but still more by the rich social returns along the line of social uplift and the intensification of community interests.

At present there are no showers in any grammar school; and of the high schools, only the North Side High is properly equipped. There is no swimming pool now in use, although space for one has been provided at Aaron Gove. Bathing facilities of some kind would be a particularly valuable addition in such schools as Garden Place, Bryant, etc.

### Janitors' Quarters

With only a few exceptions, janitor's quarters are provided in the basements of the school buildings. They are usually at one corner, with two rooms exposed on one side of the building. No effort has been made to give them a sunny exposure. There is usually an interior bedroom having no immediate connection with the outside.

As a rule, the janitors' flats are dark, cold, poorly ventilated and often unsanitary because of dampness. A few have no bath (e. g., Fairview), and some have no toilet facilities apart from those furnished for the school children (e. g., Washington). Some of the worst janitors' quarters are located in the following buildings: Emerson, Swansea, Valverde, Washington, Central, Fairview, Boulevard, Webster, Columbian and Corona.

A policy which requires the janitors to live like badgers in dark underground holes cannot be justified. It is not only inhuman, it is also a short-sighted policy from the standpoint of janitorial service. The type of janitor who would be willing to occupy, indefinitely, some of the dingiest and most un-

wholesome of these quarters, would not, in all probability, be the type of individual who should render the kind of service the city needs and expects. If Denver desires to put the care of her school buildings on a better basis one of the first steps should be to abandon many of the worst living quarters for janitors and either to furnish cottages instead or increase the salaries and drop responsibility for the janitors' housing. It is not at all certain that the latter would not be better than the former. Many janitors and janitors' wives complained to the writer regarding their living quarters—some of them almost bitterly. A few indicated their preference for a cottage of their own choosing.

### Fire Protection

Notwithstanding the large number of school buildings of old construction, and notwithstanding the many antiquated heating plants still in use, the school children of Denver are well guarded from the danger of fire. All the buildings having two or more stories are reasonably well supplied with fire escapes. Nearly all classrooms are provided with two doors, and panic bolts are to be found on the outside doors of all buildings. In addition, the school authorities have been diligent in regard to fire drills. 17 fire drills were held by the writer in as many buildings. In every case the building was emptied in from 45 to 90 seconds. The order was practically always good. The practice of marching the children not only out of the building but also a block or half a block away is to be commended.

It is impossible to exercise too much vigilance as regards protection from fire. There are dozens of school buildings in Denver, where, without proper vigilance on the part of the teachers, a terrible disaster would be possible. It is unnecessary to replace these buildings with fire-proof structures, for they are safe enough as long as proper precautions are taken.

It is recommended that as rapidly as possible the old fashioned furnaces in a number of buildings be replaced by modern heating plants. This would lessen considerably the danger of fire. In a few furnace rooms there is unnecessary exposure of wooden beams or walls rather too near the furnace. In two or three instances, a certain amount of paper or other rubbish was found in the furnace rooms.

At the Webster School there is an offset of about two inches in the floor of the halls which serve as exits to the fire escapes. This should by all means be remedied at once. One child stumb-

ling over such an obstacle might cause a complete blockade of the exit, with disastrous results.

Where possible to avoid it, fire escapes should not be located on the north side of the building in a climate such as that of Denver, because of the added danger of snow and sleet. At the Fairview, for example, the fire escape was located on the north side, which happens to be the rear of the building, when it could just as well have been given a sunny exposure. When it is a question between external appearance and the possible destruction of school children the choice should not be difficult. For the same reason the outside steps of the school building should be located where they can be kept free of snow and ice. The front steps at Clayton are so long and so steep as to be dangerous, especially in winter. At several other schools the outside steps are steep and are so shaded from the sun that it is hard to keep them free of ice. The entrance at the Maria Mitchell School is decidedly dangerous and should be altered.

### Cost and Quality of Construction

From general appearances it would seem that the cost of school buildings in Denver has not been out of proportion to the values received. Time was not available, however, for the making of any detailed or adequate comparison of costs. Such a comparison, to be of any great value, would require more time than was available for this entire division of the survey. Merely to compare cost per classroom is not sufficient, since this obviously depends upon the number and kind of special rooms and accessories. Nor is cost per pupil accommodated a satisfactory standard. The cost per cubic foot of content is better, but to make even this method of comparison valid it is necessary to take into consideration the structural specifications and all sorts of differences in the quality of workmanship and materials. Without such detailed comparison, the writer can only say that buildings like the Aaron Gove and Steele seem to be well constructed and not excessively costly upon the basis of cubical content. As pointed out elsewhere, however, these buildings could have been made much more satisfactory, without additional expense, by giving them a correct orientation and by utilizing the space to greater advantage. The classrooms could all have been considerably smaller, and the saving thus effected could have been devoted to much needed special rooms, baths, etc. A classroom 22x29 with a 12½ foot ceiling is better than one 26x32x13½

## The High School Buildings

It is not uncommon in the larger cities of the United States to find many and expensive high school buildings equipped with every modern appliance and convenience, while alongside these palaces the children in the grades attend schools which are cramped, cheap, and inadequately equipped. Such is not the case, however, in Denver. On the whole, it could hardly be said that the high school buildings and equipment are superior to those of the grades, making allowance for the difference in the actual needs of the younger and older children. Denver has one high school building which ranks as thoroughly modern; the others range all the way from fair to very unsatisfactory.

*The North Side High School.* This building, which was erected four years ago at a cost of approximately \$600,000, represents the most advanced type of school house constructed in Denver. Its architectural features are pleasing. Still more important, its appointments are complete and, for the most part, well adapted to their purpose. The shop, laboratories and classrooms are little open to criticism. The building has a splendid auditorium, two large cafeterias, tile floors in the halls, vacuum cleaning equipment, humidifiers, a large gymnasium with showers, and thoroughly modern toilets.

Attention should be called, however, to the following faults—some of them remediable, others, unfortunately, not. Perhaps the most serious fault is the lack of ventilation in the gymnasium. Of all the rooms in the school building there is no other in which it is more important to have ideal ventilation. Another mistake was made in locating the lunch rooms so far from each other without a kitchen between them. The classroom located just over the boilers is at present kept insufferably hot. Attempts have been made to remedy this difficulty, but so far without success. The room should be abandoned unless the supervising engineer can find some way to make it comfortable. The library is rather dark, and the science lecture room has no ventilation.

*The Manual Training High School.* This school has a large plant, fairly well equipped for class work, but lacking many of the important accessories. There is no gymnasium; there is only one shower for the girls; and in the boys' toilets there are only six seats to be used by five hundred pupils. The cafeteria is an immense basement room, practically without light. The halls of the building, the principal's office, and a number of the classrooms are also extremely dark. The room used for typewriting and stenography is an old shop room, remodeled. It is so dark as



to be quite unsatisfactory. Room 12 is only 12x15 feet in area, has no outside light, and may be literally described as a dungeon. Rooms 8, 9, 10 and 11 are very dark, as are also the physics laboratory and lecture room.

Both the building and grounds are too small to accommodate the number of pupils enrolled. The other half of the block should be added to the present site, and a number of additional classrooms should be provided. Classes are now reciting in the principal's office, the cafeteria room, and various cubbyholes about the building. One way of securing new classrooms would be to utilize the old auditorium, dividing it by solid partitions. A new auditorium should then be constructed, adapted for use as assembly room and gymnasium.

*West Side High School.* This building, which was constructed in 1892, is little adapted for high school purposes. Classrooms are provided in sufficient number for the pupils, but little else. The laboratories are cramped and dark, and there is no satisfactory room for domestic science, shop work or cafeteria. The school has no play ground, no gymnasium and no showers. Even the classrooms are, for the most part, unsatisfactory. The lighting of rooms 3, 7, 26, 31, 33, 36 and 37 is very bad. Room 36 has been improvised from an old store closet 12x35 feet in area, with only a little light at one end. The rooms on the third floor are nearly all too dark to justify their use. The laboratories are dark, crowded, and inconvenient. The library is extremely small and dark. The janitor's quarters are located in the basement on the shady side and are damp.

This building was out of date at the time it was erected. Little forethought or expertness directed its planning. As a result, we have a building which is just as solid as new but unsatisfactory for its purpose and difficult to remodel. Perhaps the best that could be done would be to improve the lighting and make a number of changes which would make it possible to use it for a junior high school.

*South Side High School.* This is a cheaply constructed building, erected in 1906. As regards classrooms, it is by no means bad, but, like the West Side High School, it is little adapted to high school purposes. There is no room for manual training, domestic science, or physical training. There is only one shower in the building. The school is overcrowded, the library being used for class purposes all day. The typewriting room (if it could be called a room) has been improvised from a hallway. It is 40 feet long but only six feet wide, and is lighted at one end. Upwards of twenty students use it con-



stantly. Rooms 7, 8 and 11 are also badly lighted. Odors from the boy's toilet are perceptible at some distance in the hall, and the principal's toilet is ventilated into his office.

This building is not as satisfactory as it should be, considering the comparatively recent date of its construction. A junior high school is needed in this section of the city, and the best disposition which could be made of the present building would be to work it over for this purpose.

*East Side Latin High School (Broadway).* This is an old-fashioned, eight-room building with classrooms lighted on two sides. The heating, lighting and ventilation are thoroughly unsatisfactory. The walls are not firm enough to justify extensive repairs; moreover, the grounds, though small, are valuable. The site should either be utilized for an administration building for the school department, or, perhaps preferably, sold.

*The East Side High School.* It is unnecessary to describe this building in detail, since it is located near the center of the city and is a landmark with which every citizen is acquainted. It was constructed more than one-third of a century ago, when Denver was little more than a country town. Considering the resources of the city at that time, and the standards of school architecture in vogue, this building was a splendid achievement. It must have ranked as one of the very best of its day in any of the western cities, if not in the United States. Its halls and rooms are spacious, and still have a certain tone of luxury and dignity. Even today, its classrooms and laboratories are better adapted for the work of the high school than those at West Side. Among its worst faults are the unsuitable laboratory facilities and the lack of equipment for the many things which have been added to the high school course of study in recent years. To be sure, many of the rooms are dark and a number are badly ventilated. The room used for typewriting should be especially mentioned in this connection. In its present condition the latter is entirely unfit.

The ground on which the building is located is very valuable. It will doubtless be found advantageous to dispose of the property, as soon as legal arrangements can be made, and to erect a new high school building at some distance from the business district of the city.

### **The Modernization of Old Buildings**

Much has been said in criticism of the heating, lighting, ventilation, toilets and various appointments of the older buildings. It is evident that in their present conditions many are

unfit for use. However, any program looking toward the replacement of all those which are unsatisfactory would involve an expenditure too large to be easily borne. The important question arises, therefore, as to the possibility of working over some of the out-of-date buildings in such a way as to make them more hygienic and usable.

Several of the older structures, at a cost by no means prohibitive, could be remodeled so as to give fair service for another quarter of a century. The repairs most commonly needed are those relating to heating and ventilation, lighting, toilet facilities, stairways and special rooms. We have already enumerated some of the buildings where repairs of various kinds ought to be undertaken. The list there given should be taken merely as a point of departure for the intensive study of the possibilities along the lines of reconstruction. Such a study would require some months of work on the part of the superintendent of buildings, but compared with the haphazard method of school repairing the returns would be worth many times the cost and trouble.

The lighting, especially, should be improved wherever possible. Many rooms now lighted on two or three sides could be given unilateral lighting with windows banked to the left of the children. In order to accomplish this, certain windows would have to be closed up and others thrown together by tearing out the wide mullions between the windows and substituting steel frames yielding practically unbroken lighting area of, say, 9x20 feet.

Nurse's rooms, store rooms, rest rooms, libraries, etc., could be provided by partitioning classrooms. In many cases the shops could be removed to annex buildings, and the present quarters utilized for showers or playroom. The stairs in some of the buildings would need to be replaced by new ones more suitably located, and not so steep. The most important improvement needed, and the one which will give the greatest returns for the cost, is the re-tinting of the walls and ceilings throughout the city in suitable colors.

Plans should be made to abandon the following buildings at the earliest possible moment: Bryant (old part), Fleming, Globeville, Grant, Fairview, Garfield (old part), Glen Park, Washington, Broadway and Franklin. Several others are little better. It would be well if a single well-equipped centrally located plant could be substituted instead of the two buildings, Vassar and Milton. Grant should be torn down and a modern plant should be erected on a new site large enough to accommodate the pupils now attending Grant and Fleming.

Special mention should be made of the Longfellow School, which was built in 1882 and 1889. Although this building is spacious, firm, and fairly respectable in appearance from the outside, it is totally unfit to be used as an ordinary day school, and its recent abandonment, on the recommendation of the superintendent, was justified. However, by a certain amount of remodeling, this building could be admirably adapted for use as a cosmopolitan high school. The present narrow and widely separated windows could be doubled in size without impairing the firmness of the structure. In some rooms, the mullions between the windows could be removed entirely and steel frames substituted. Besides the lighting, certain other repairs and alterations would be necessary. The total cost might not exceed ten thousand dollars, and the result would be a school building of large size, conveniently located, and capable of giving service for many years.

## HEALTH WORK IN THE SCHOOLS

---

LEWIS M. TERMAN,

---

### History and Purpose of School Health Work

Systematic health work in the schools of the United States began with the inauguration of medical inspection of schools in Boston in 1894. Similar work was undertaken by Chicago in 1895, by New York in 1897, and by Philadelphia in 1898. By 1907 about 90 cities in the country employed school doctors; by 1910, 337; while at present practically every city of any considerable size in the United States has some kind of school medical supervision. In 1910 there were nearly 1,194 doctors and 371 nurses at work in the public schools of this country. In the last five years the work has developed at a still more rapid rate.

The health supervision of schools is not a passing fad, but a necessary measure for the conservation of children. It is not without significance that such work has developed simultaneously in all the civilized countries.

The movement illustrates the general change which has taken place in recent years as regards the attitude of society toward the individual. The same humanitarian spirit which demands the abolition of slums, the protection of the working man, the limitation of the hours of working women, the prohibition of child labor, the extension of recreation facilities, etc., is also responsible for the attempt to conserve the children of the nation by means of health work in the schools. The children of today are viewed as the raw material of a new State; the school as the nursery of the nation. To discover the physical disabilities of children and to bring about their treatment and cure through the cooperation of the parents is a social duty which can best be discharged through the instrumentality of the school.

The argument that school health work invades the rights of the home has no more basis than the corresponding argument against compulsory school attendance or prescribed courses of study. Thus far the school has claimed nothing more than the right to examine the children and advise parents as to the proper action. It enlarges the parents' responsibility rather than otherwise.

Sometimes the argument is offered that school medical inspection is not necessary, that the parent is in a position to know whether the child needs a doctor. "The child is under the observation of the parent many hours of the day every day in the year; does not this constitute sufficient guardianship of the child's physical welfare?"

The above question may be answered very positively in the negative. It is no reflection upon the intelligence of the home to say that the average parent is in no better position to inspect the health condition of the child than to take complete charge of its education. Indeed, the latter would be much more nearly possible. The incontrovertible fact is that in any city as large as Denver there are thousands of children with serious physical defects, the existence of which the parents have never suspected. Parents have not learned how to read the health index of children. Often they fail to discover in their children such conditions as one-half normal vision, one-fourth normal hearing, serious obstruction of breathing by adenoids or tonsils, anaemia, spinal curvature, etc. Heart disease and tuberculosis in children are never recognized by the parents in their early stages.

When medical inspection was begun and it was found in city after city that some 50 to 75 per cent of the school children had one or more serious physical defects, the announcement seemed almost incredible. Now we are accustomed to such figures, for remarkably similar findings have been made in all the cities of all countries. These defects were as common before medical inspection began as they are now. Their existence simply was unknown. In the light of such facts, it is surely unnecessary to argue for the need of school doctors. There is no way to avoid the conclusion that if the health of children does not receive medical supervision in the school it will have no expert attention at all in the case of a large majority of children.

It is interesting to note that in the earlier period of medical inspection the attention of the school doctors was little occupied with chronic physical defects, as those of vision, hearing, etc. Everywhere the work was undertaken primarily as a means of combating contagious diseases, such as measles, scarlet fever, diphtheria, etc. Gradually, however, the school doctors became aware of the existence of numerous chronic defects which are ordinarily overlooked, defects which in the long run produce greater mortality and morbidity than the common contagious diseases. While ordinarily not more than three children out of one hundred need to be excluded from school in any one year because of contagious diseases, about 50 to 75 children out of

100 suffer from some chronic physical handicap. This discovery led to the broadening of the scope of school health work, so that now, in a number of cities, it embraces almost every responsibility and function which has to do in any way with the physical welfare of children. There can be no doubt that the broadening and intensification of the school medical service will continue until nothing is left undone which makes for the physical conservation of children. The responsibility is concerned as much with the preservation of health as with the training of mental faculties.

It is true that opposition to school medical inspection is sometimes heard. This was very common in the earlier experimental period, but such opposition has practically ceased wherever the work has been given a thorough trial. The little that now remains comes chiefly from three classes: (1) those who are not aware of the frequency of defects among children and who are under misapprehension as to the purpose of the work; (2) those who do so from religious prejudices; (3) those who are financially interested in conserving sickness and physical defects rather than conserving health. While these opposing influences may be expected occasionally to retard the progress of school medical inspection, ultimately they are certain to be overcome. No city has yet taken any serious backward step after inaugurating the work, although agitation against it has in some cases caused a temporary wavering of progress.

### **What Denver is Doing**

The city of Denver appears not to have awakened to the existence of such facts as those above set forth. It is hard to find a single city of any size in the United States doing as little for the health of its children as Denver. The children of Denver are still taught as though they were disembodied spirits. Practically all the health work which is being done in the schools is carried on by the teachers themselves. There is no medical service except that rendered by a young doctor just out of medical school, who works under the attendance department. There is only one part-time dentist, and the only nurse giving any time to the school children is the nurse assistant to the dentist. Much good dental work, however, has been done.

It may be asked whether the work ordinarily done by school doctors, school nurses and school dentists is carried on through other agencies. The answer is that by far the greatest part of it is simply left undone. There is a state law dating from 1909 requiring teachers to make annual tests of the vision, hearing

TABLE I

		Per Capita Expenditure for Health Work.	By Board of Education.	By Board of Health.	By Both Jointly.	No. Full-Time Physicians.	No. Part-Time Physicians.	Salary Medical Director.	Salary Full-Time Physicians.	Salary Part-Time Physicians.	Total Salary Physicians
1	Oakland	81	x			1	1	\$3000		\$1200	\$4200
2	New York	80		x		9	120	5000	3000	1200	17300
3	Pittsburg	74			x	35		5000	1200 to 1500		49200
4	Rochester	71		x		1	12	3000		900	13800
5	Detroit	70		x			40	1000		40.00 per mo.	
6	Minneapolis	65	x			1	8	3600		630	8640
7	Syracuse	605	x			1	6	1200		3000	4200
8	Albany	59	x			1			2500		2500
9	Trenton	58	x				10	500		250	2750
10	Chicago	53		x		11	165	3900	1440 to 2400	70.00 to 120.00 per mo	
11	Boston	49	x			1	41	1500	500	500	2200
12	Philadelphia	48			x	5	60	3000	1500	600	4650
13	Jersey City	44	x			1	14	1800	900	420	8160
14	Seattle	435	x			1			3600		3600
15	Milwaukee	43	x			1	11	3800		600	10400
16	Los Angeles	42	x			6	5	2500	2100	1200	10300
17	Newark	40	x			1	9	2350	1200	500	7550
18	Providence	39		x			7	1500		800 to 2000	3400
19	Reading	38	x				3	750		400	1450
20	Spokane	36	x			1		2600			2600
21	Cleveland	36	x			16		3500	100.00 per mo.		
22	New Haven	36		x		3			1000 to 1200 per year		3400
23	St. Louis	34	x			12		3500	1200 to 1500		
24	Cincinnati	34		x		11	4	2750	300	3950	
25	Cambridge	325		x			6			250	1500
26	Scranton	308	x			1	20	1000		225	3250
27	Richmond	305	x			1	2	2000		450	2500
28	San Francisco	30		x		3		1800	1200		4200
29	Atlanta	27	x			2	3	1800	450	900	3150
30	Camden	26	x			1	4	2400		1600	8000
31	Hartford	25	x				5			600	3000
32	Dayton	25	x			1		2500			
33	Grand Rapids	23	x			1		1500			1500
34	San Antonio	19	x			1			685		685
35	Worcester	18		x			15	700		200	3150
36	Fall River	18	x				8			150	1200
37	New Orleans	145	x				3	150.00 per mo.		20.00 to 120.00 per mo.	
38	Baltimore	13		x			6			600	3600
39	Portland	12		x			4	120.00 per Mo.		50.00 per mo.	
40	Denver	07	x					1100			
41	Paterson	065	x				6			250	1500
42	Kansas City			x		Voluntary					



TABLE I—Continued

No. Full-Time Dentists.	No. Part-Time Dentists.	Salary Full-Time Dentists.	Salary Part-Time Dentists.	Total Salary Dentists.	No. Full-Time Nurses.	No. Part-Time Nurses.	Salary Full-Time Nurses.	Salary Part-Time Nurses.	Total Salary Nurses.
2	3000	\$3000 to 1800		\$4800	9		\$1200		\$10800
	10		1500 to 1200	13000	241		900 to 1140		258660
	8		750	600	18		900		16200
1	1	1000	500	1500	9		840		7560
6	24				22		1000		23200
	1		630	630	26		50.00 to 80.00		
							per mo.		
	1		900	900	8		760		6080
	1		400	400	4		750		3000
					8		600		4800
10	1	100.00 per mo.	100.00 per mo.		100		75.00 to 165.00		
							per mo.		
1	13	2500	700	12300	39		800		31200
					40		750 to 1000		30400
1		1800		1800	13		720		9360
2		1800 to 1500		3300	7		900 to 1100		
3		2100		6300	5		1000		5000
					7		1104		7728
	1		500	500	26		720 to 1000		
	1		400	400	9		75.00 per mo.		
					4		480		1920
	5		100.00 per mo.		3		1000		1000
1	1	1000	3000	1320	26		720		18720
					7		700		4900
	6		50.00 per mo.		22		600 to 720		
	1		75.00 per mo.		14		840		12760
					3	2	800 to 1100	Not paid by city	2700
						4		65.00 per mo. + car fare	
					7		720 to 810		5400
					14		900 to 1020		11320
					5		740		3700
					2		760		1520
	1		60.00 per mo.		2	Visiting Teacher	75.00 to 80.00		2000
							per mo.		
1		1200			4		55.00 per mo.		
					1	1	900	225	1125
					1		800		800
	2		1000	2000		12			
	40		Services gratis		1		70.00 per mo.		
	3		Gratis		10		600		6000
	1		10.00 per day		1		95.00 per mo.		
	1	1000				1			40.00 per mo.
					1		Paid by Char. Organization		
	31	Gratis			Teacher	s of Physical Culture			

and breathing of all children. While this law has had important results, it is a generally recognized fact that school teachers can exercise only a small portion of the functions of school nurses and doctors. Not only are teachers as a class inexperienced in the observation of physical defects; they are also too busy with instruction to give the necessary time to the observation of defects and to home visits in behalf of the children. Although teachers are able to test vision and hearing fairly accurately, such tests are of little value unless the parents can be persuaded to secure glasses for defective eyes, or the necessary treatment for defective hearing.

Denver devotes about seven cents annually to the health protection of each child. The sum is so inadequate that probably a good deal of the money spent for the child's instruction each year is lost. So little is Denver doing for the benefit of the health of its school children that it is really not worth while to inquire whether the little that is done is satisfactory. The problem remains almost untouched. The decision which Denver must make is not whether the work is to be altered in this way or that, but whether anything of importance is to be undertaken at all. It seems incredible that the city would long be willing to remain among the poorest and least progressive of all the cities in the country in this respect. Surely Denver's children are not less worth preserving than the children of any other American city.

### **What Other Cities are Doing**

The data presented in the following table were gathered by means of a questionnaire which was sent to all the cities in the United States having a population of 100,000 or over. Forty-two out of fifty such cities responded. The table shows many interesting facts relative to the amount expended for school health work, the method of control and the number and salaries of physicians, dentists and nurses.

The foregoing Table I shows the cities of the United States in many stages of progress. Some have a highly developed and reasonably adequate system of medical inspection, while at the opposite extreme are cities like Denver, Paterson, Baltimore, Portland (Oregon), and Kansas City.

It would be a serious mistake to accept what the average city is doing as the ultimate standard to work toward. Medical inspection is so new that no city is doing everything that ought to be done. The standard should rather be not what is found in the mediocre city, but what the most advanced cities are doing. Let us see what that standard would be.

Oakland, California, with an enrollment of 26,000, expends \$21,000 per year, which is 81 cents for each child. A mature and very experienced medical director is employed at a salary of \$3,000 per year. There is one part-time assistant physician with a salary of \$1,200 per year, two full-time dentists, and nine full time school nurses. The budget for nurses alone is \$10,800.

Minneapolis, with 46,000 pupils enrolled, expends \$30,000, or 65 cents per year per child. The medical director is paid a salary of \$3,600. There are eight part-time physicians on a salary of \$630 each. There is only one full-time dentist and one half-time dentist, but there are 26 full-time nurses.

Rochester, New York, with a school enrollment of 32,000, expends \$17,640, or 71 cents per capita. The medical director receives a salary of \$3,000. There are 12 part-time physicians at \$90 each, one full-time and one part-time dentist, and nine full-time nurses.

Pittsburg, with a school enrollment of 72,544, expends, \$53.-610 per year, or 74 cents per child. The medical director is paid \$5,000 and 35 part-time physicians are employed at from \$1,250 to \$1,500 per year. In addition, there are eight part-time dentists and 18 full-time nurses.

Cleveland, Ohio, with 96,578 pupils enrolled, expends \$35,000 per year, or 36 cents per child. 16 full-time physicians are employed at \$100 per month. The medical director received \$3,500. There are five part-time dentists and 26 full-time nurses. The nurses are paid \$80 per month, and the budget for nurses is \$18,720.

New York City, with an enrollment of 790,872, expends \$643,680 per year, or 80 cents for each child. The medical director's salary is \$5,000. There are nine full-time physicians, 120 part-time physicians, 10 part-time dentists and 241 full-time nurses. The annual budget for the nurses amounts to more than a quarter of a million dollars.

Contrasted with the above, Denver expends approximately 7 cents per year per child. The one physician employed is young and inexperienced, and receives a salary of \$1,100 per year. His work falls in the attendance department, which means that his function has been interpreted to be chiefly that of

combating diseases which occasion absences. As a matter of fact, much of his time is devoted to the eradication of parasites in some of the poorer schools of the city. The one school dentist can take care of but a small fraction of the children whose teeth will not otherwise receive attention. The absence of school nurses for follow-up work means that the little inspection which is done cannot be expected to bear much fruit. Over and over again it has been demonstrated that medical inspection without home visits is largely futile.

*Per Capita Cost.* The better systems of health supervision in the cities of the United States usually cost from fifty cents to seventy-five cents per year for each child. A few are a little more expensive than this, and those costing very much below forty cents are certain to be inadequate. In the near future expenditures for this purpose will doubtless increase in the more progressive cities to one dollar or more per child. The term "cost," as here used, includes salaries of physicians, dentists and nurses, medical supplies and printing, the equipment and maintenance of dispensaries, etc. The following table shows the expenditure per child for each of the 17 cities having a school enrollment between twenty thousand and fifty thousand.

TABLE 2.

Annual Expenditure per pupil for Health Supervision in 17 Cities having 20,000 to 50,000 enrollment.

1	Oakland.....	\$.81
2	Rochester.....	.71
3	Minneapolis.....	.65
4	Albany.....	.59
5	Seattle.....	.435
6	Milwaukee.....	.43
7	Providence.....	.39
8	New Haven.....	.36
9	Richmond.....	.306
10	Scranton.....	.305
11	San Francisco.....	.30
12	Salt Lake City.....	.25
13	Worcester.....	.18
14	New Orleans.....	.145
15	Portland.....	.12
16	Denver.....	.07
17	Paterson.....	.065

The one city ranking below Denver is the lowest city, but one, among the entire 42 cities with a population above 100,000, from which data were available. Even Paterson, although spending a fraction less than Denver for health work, is apparently accomplishing more. It would be interesting to know whether the citizens of Denver really do not want more than seven cents worth of health protection for their children or whether those whom they have charged with the conduct of the schools have neglected their trust.

*Method of Control.* The health supervision of schools began in most cities as an extension of the functions of the al-

ready existent Board of Health. As long as the work was confined to the prevention of epidemics, this was satisfactory. As the work extended, however, and came to include inspection for all kinds of physical defects, and particularly as the prevention of disease became more and more the end, it was found desirable to place the work directly in the hands of the Board of Education. This insures that the emphasis will be placed upon the prevention and cure of defects and that it will not be confined merely to the eradication of parasites and the prevention of measles, whooping cough, etc. Of the 42 cities having above one hundred thousand population, 25 have lodged the control with the Board of Education, 15 with the Board of Health, and two have divided control. While in the main, the cities which have intrusted the work to the Board of Education have the better systems, there are many exceptions to this rule. Among those spending less than 15 cents per year for each child, New Orleans, Paterson and Denver have placed the work under the Board of Education. On the other hand, among those spending more than 60 cents per child, New York, Detroit and Rochester have lodged the control with the Board of Health. We may conclude, therefore, that while it is undoubtedly desirable in most cases to have the work under the Board of Education, it is not impossible for the Board of Health to carry it on satisfactorily. Much depends upon the medical director behind the system.

As long as the health supervision in Denver remains in its present pitiable condition, it matters little who is responsible for it. Nothing better gauges the degree of broad-mindedness and humanitarianism of the Board of Education than its attitude toward the child's physical welfare.

*The Number of Physicians and Nurses.* The number of physicians required depends largely upon the number of nurses; and the number of nurses needed depends in turn upon the number of physicians. Some cities have few physicians and rely almost wholly upon the work of the nurses. Others have few nurses and many physicians; still others have a moderate number of each. Oakland, for example, which has one of the best systems of health supervision in the United States, has only about three-fourths as many school children as Denver and employs nine full-time nurses, one full-time physician, and one half-time physician. Paterson, New Jersey, on the other hand, the only other city which ranks lower than Denver, has only one nurse and six part-time physicians for 22,000 children. Portland, Oregon, has one nurse and four part-time physicians.

In the beginning, cities usually employed many part-time school doctors and few nurses. In fact, school nursing can hardly be said to have begun in the United States until a decade ago. It was found, however, that the plan of much inspection and little follow-up work was comparatively futile. If supervision is to bear fruit, it is necessary to bring about a treatment of the defects which have been discovered. This the nurse accomplishes by home visitation. Moreover, it has been found that the well-trained school nurse is capable of doing much of the work of physical examination. She tests vision and hearing and observes defects of breathing, nutrition and posture fully as well as does the average physician. The school nurse has even proved her ability, after sufficient training, to detect the early symptoms of contagious diseases. The present tendency favors the employment of many nurses and only a moderate number of physicians.

A city the size of Denver should have from three to five full-time physicians, and from eight to twelve full-time school nurses. Besides the medical director, there should be a female physician for the high-school girls, and a male physician for the high-school boys. There should be at least a half-time, and preferably a full-time medical assistant whose work would be confined to the grades below the high school. It is everywhere conceded that the number of children per nurse should not, under the most favorable conditions, exceed five thousand. At this proportion, Denver would require a minimum of seven nurses. The standard, however, is rapidly coming to be one nurse for two thousand or three thousand children. On this basis, Denver needs from ten to fifteen nurses.

In several schools of the city it was asserted by the principal that half the time of the school nurse was needed in that one school. Bryant and Garden Place are schools of this type, but there are several others where the services of the school nurse are about as much in demand.

Albany, with only 12,566 school enrollment, has four full-time nurses. Atlanta, Georgia, which is only two-thirds as large as Denver, has five full-time nurses. Minneapolis, with only 30% larger school enrollment than Denver, has 26 full-time nurses, as does also Newark. Providence, with about the same population as Denver, employs nine full-time nurses. Richmond, Virginia, which is only two-thirds as large as Denver, has seven school nurses. Rochester, New York, with 32,000 school enrollment, has nine full-time nurses; San Francisco, with 46,000 children, has 14; St. Louis has 22; Philadelphia, 40; Chicago, 100; and New York, 241. The salary budget for school nurses in New York



City is \$258,660. The recommendation of eight to ten nurses for Denver would certainly be conservative.

It is a serious mistake to suppose that only the children of the poorer districts benefit from the school nurse, for the latter has proved herself indispensable in the best neighborhoods. In fact, the more intelligent the parents the more they appreciate her ministrations and guardianship.

*Full-Time Versus Half-Time Physicians.* Some cities prefer to employ many half-time physicians; others, only a smaller number on full time. Cleveland, Pittsburg and St. Louis employ respectively 16, 35, and 12 full-time physicians and no half-time physicians at all. On the other hand, Boston, Detroit, Rochester, Jersey City, Worcester and many others, prefer to depend chiefly upon half-time physicians.

The medical director, at least, should be employed on the full-time basis. The work is so many-sided as to require extensive organization, and so different from the ordinary practice of medicine as to demand special interest and preparation. A part-time director can hardly be expected to bring to bear on the work the necessary degree of concentration and expertness. Some of the additional physicians may advantageously be employed on the part-time basis, provided they are reasonably well paid.

It is sometimes possible to secure better physicians at a salary of \$1,200 for half-time, than it would be possible to secure at a salary of \$2,400 for full time. The practice of employing large numbers of part-time physicians, on a salary of \$300-\$400 a year cannot be too strongly condemned, as it is a policy which necessarily places the work in the hands of incompetents. Where the health or even the very lives of the children are at stake, such measures of economy cannot possibly be justified.

*Salaries of Nurses.* Nurses in various cities are paid from \$65 to \$165 per month. More often the salary falls between \$800 and \$1,000 per year. The nurses are ordinarily on duty from 8:30 in the morning till 4:30 in the afternoon, every day in the week except Saturday, when their duties end at noon. The work is very strenuous and demands a good training. There is no reason why the pay of a nurse should not be fully equal to that of the best paid teachers below the high school.

*The Medical Director.* There is no office in the school system, except the superintendency itself, which ranks in importance with that of the medical director of health. It has been found that the effectiveness of the health work depends in large measure upon its method of organization. It may be so organized as to bring the maximum of results with the least expenditure of



effort and the least danger of misunderstanding and opposition on the part of the parents. On the other hand, a system fairly well supported may be ineffective because of the misplacement of emphasis, because of the inexperience of the nurses and assistant physicians, because of the lack of cooperation of the teachers, or because of the opposition of the citizens. What kind of a system it will be depends upon how it is moulded by the one in charge. The right kind of director can take inexperienced nurses and within a few months make them efficient. The director with the right kind of personality can change the attitude of the teachers and citizens from one of opposition, to one of understanding and support. An important part of the director's equipment is his ability to command the respect and enlist the co-operation of local physicians and hospitals. It goes without saying that he should be highly trained, mature, experienced, and particularly interested along the lines of preventive medicine. To intrust such a responsible position, one making such heavy demands upon technical equipment and experience to a youth just graduated from medical college, is as absurd as it would be to intrust the superintendency of the schools to a young man who has just returned with his college diploma. In fact, the latter would be fraught with less danger than the former; because, whatever the weaknesses of the superintendent, they will be in large part counteracted by the maturity and experience of the scores of principals and hundreds of teachers.

It is evident that the kind of physician we have described cannot be secured for the salary of a school nurse or kindergarten teacher. Three thousand dollars should be considered the very minimum for a city of Denver's size, and it would be cheaper in the long run to pay \$4,000. The salaries in 24 cities from which data were available range from \$750 to \$5,000. In at least ten, the salary reaches or exceeds \$3,000. Milwaukee pays \$3,800, Minneapolis \$3,800, Seattle \$3,600, and Rochester and Oakland, both smaller than Denver, pay \$3,000.

*School Dentistry.* It seems to be a common opinion that since Denver has a school dentist, the teeth of the school children are being fully cared for. By many it is not realized how little one part-time dentist can do in a city where the school enrollment is 35,000. Detroit employs six full-time dentists, and 24 part-time dentists. Los Angeles employs three full-time dentists. Pittsburg employs eight for part-time. Denver should have at least the equivalent of two full-time dentists. Two thousand five hundred dollars per year, full time, or from \$75 to \$100 per month, half time, would be a reasonable compensation.

## Health Conditions Among Denver School Children

It may be maintained by some that whatever may be needed elsewhere, the physical conditions of Denver children do not demand such an extensive system of school health work. Such a view is very common in cities where medical inspections have not been made. When these are undertaken, however, it is invariably discovered that the proportion of children with any given kind of defect is fairly constant for all cities. The very best and most aristocratic cities in the country, such as Pasadena and Berkeley, have about as high a percentage of defectiveness as the average city of the Middle West. Indeed, making allowance for the slight differences of procedure in the examinations, we find that the per cent of children with adenoids is much the same in California as in Indiana, New York, New Orleans, Boston, London, Berlin, Paris, Australia or Japan. If we know the proportion of children with imperfect hearing in Los Angeles or Oakland, then we know the approximate percentage of children in Denver having this defect. The same holds true for defective vision, spinal curvature, mal-nutrition, heart disease or other types of chronic defects. In order to show the problem which faces the board of education the following questionnaires were submitted to all the teachers in the city.

### One to Each Class Teacher.

Name of School.....Grade.....Room.....  
Name of Teacher.....Number of pupils.....

(To be filled out without asking children. Accuracy important.)

1. Number of pupils who have frequent or chronic difficulty in breathing through the nose.....
2. Number who have frequent or chronic nasal discharge..
3. Number who have nasal or thick voice.....
4. Number whose hearing has been tested this school year .....
5. Number who show symptoms of imperfect hearing.....
6. Number who sometimes have running of the ears.....
7. Number who stutter or stammer.....
8. Number whose vision has been tested this school year..
9. Number who show symptoms of eye defects, redness or watering of the eyes, squinting, frowning, cross-eye, holding book too near, miscalling familiar words, etc.....
10. Number who wear glasses regularly.....

11. Number who have some marked peculiarity, such as irritability, muscular twitchings, nervousness, excessive timidity, tendency to cry without cause, tendency to worry, etc. ....
12. Number who show tendency to some moral abnormality ....
13. Number who show marked lack of mental alertness. ....
14. Number who are noticeably lacking in play activity. ....
15. Number who are delicate or frequently ill. ....
16. Number whose posture is habitually faulty. ....

One to Each Class Teacher.

Name of School.....Grade.....Room.....

Name of teacher.....

Total number of pupils questioned.....

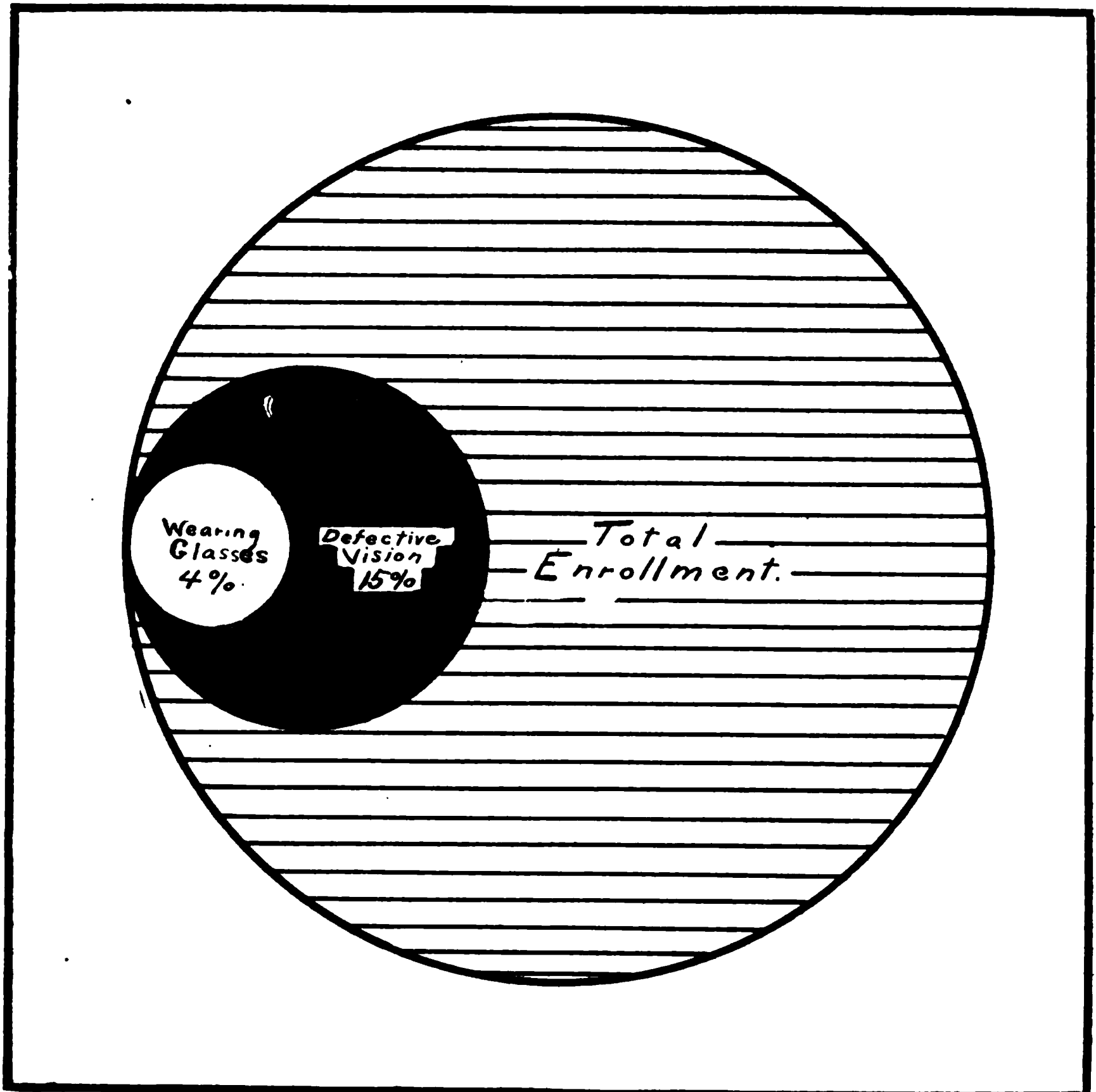
Directions—Ask the children the following questions and record the results. It is important to ask the questions with the proper degree of seriousness and to urge the pupils to answer as correctly as possible.\*

1. How many have headache often (two or three times a month)? .....
2. How many have earache often (two or three times a month)? .....
3. How many have sore throat or colds often (two or three times a month)? .....
4. How many have had adenoids or tonsils removed? .....
5. How many have had adenoids or tonsils taken out in the last year? .....
6. How many often have serious pain or watering of eyes? .....
7. How many cannot easily read the writing on blackboard? .....
8. Does the print often seem to blur, or run together, or look double (record number of affirmative answers)? .....
9. How many have gone to a dentist at some time? .....
10. How many have gone to a dentist in the last year? .....
11. How many have a tooth brush? .....
12. How many have used a tooth brush in the last twenty-four hours? .....
13. How many have toothache often (two or three times a month)? .....
14. How many usually come to school without breakfast? .....
15. How many do not usually eat lunch? .....

\*Children in the kindergarten and first grade were not given these questions.

## What the Foregoing Questions Revealed

*Defective Vision.* 67 per cent of the children enrolled in the grades below the high school have had their vision tested by the teachers during the present school year. 11 per cent are reported as showing marked symptoms of eye defect. When the children themselves were questioned, 17 per cent testified that the print sometimes blurs, and 15 per cent that they sometimes have pain and watering of the eyes. On a conservative basis it may be estimated that at least 15 per cent of the children of Denver have a visual defect which ought to be corrected by glasses. When we compare with this figure the per cent of children who are actually wearing glasses, we have a good index to the efficiency of Denver's school health work in this line. The census of the children taken by the teachers shows that only four per cent are wearing glasses; in other words, about one in every four of the children who need them. This is seen in the following figure:



Showing proportion of those having defective vision who wear glasses.

The state law which requires annual tests of vision is of little value unless the results of the tests are followed up. If school nurses were employed in sufficient number, the proportion wearing glasses could soon be brought to eight or ten per cent.

Every intelligent person knows that eye strain causes headache, nervousness, and sometimes general ill health. It is unnecessary to argue for the desirability of keeping in good condition those organs of sense through which children acquire most of their learning. Failure to correct defective vision and to avoid the conditions which are responsible for it are examples of costly neglect. That the proportion of children with defective vision increases rapidly in the upper grades is doubtless in part the result of the improper lighting of the classrooms. It costs no more to light schoolrooms correctly than incorrectly.

The schools of Denver should employ a special physician for eye, ear, nose and throat troubles, and a special clinic should be maintained. Parents who could not afford to employ an oculist could have their child taken to this clinic and fitted with glasses at no expense other than the actual cost of the lenses themselves. Even the latter expense could be borne by the city when necessary. There is no more reason why children's eyes and health should suffer because of the poverty of their parents than that children should grow up in ignorance because parents have not the money to purchase books and hire teachers. To make the most of the raw material of the coming State is the chief obligation of the adult generation today.

*Defective Hearing.* Under the state law requiring annual tests of hearing, 67 per cent of the school children below the high school have been tested during the present school year. Four per cent were reported by the teachers as having imperfect hearing; 17 per cent of nearly 23,000 children questioned testified that they are subject to frequent earache. Two per cent of the children are said by their teachers to have chronic discharge of the ear.

The above figures are typical. It is always found that 5 to 10 per cent of the children in any school system are more or less hard of hearing and that about one child out of a hundred may be classified as semi-deaf. Two per cent with ear discharge is about the usual proportion. Children in the latter condition are urgently in need of attention. Chronic discharge from the ear means that there is an infection of the middle ear and that the ear drum has been perforated if not entirely destroyed. There is constant danger that the infection will spread to the mastoid

sinus. The child with ear discharge is on a road which may quickly lead to deafness or to something worse.

The treatment of discharging ear is very tedious. In many cases it is necessary that for months the child go to the physician daily or several times each week for treatment. To insure the proper care of such cases the school medical clinic is absolutely essential.

It is a well known fact that the majority of cases of defective hearing could have been prevented. Ear trouble nearly always begins in the throat and is usually associated with adenoids, enlarged tonsils or some other kind of chronic throat trouble. In young children the eustachian tube, which leads from the pharynx to the middle ear, offers an easy path over which infection may travel.

*Nose and Throat Trouble.* Nine per cent of the children are classified by the teachers as mouth-breathers. Five per cent have chronic nasal discharge and 6 per cent a nasal, thick voice. Twenty per cent have colds and sore throat as often as two or three times a month. This statement of conditions is rather surprising in the light of another fact ascertained, namely, that 13 per cent of the 23,000 grade children questioned had had adenoids or tonsils removed. 4.2 per cent had had adenoids or tonsils removed during the present school year. It would seem, however, that in spite of this excellent report, there must be many other children with obstructed breathing and other nose and throat disorders. This, doubtless, is due in no small measure to the abnormally low humidity of the schoolroom air. As we have shown elsewhere, the school children of Denver are compelled to breathe air which is so dry that the hardiest of vegetation soon withers and dies under its influence. Whatever the humidity of the air, it is necessary that when it is breathed it be brought almost to the point of saturation by the time it reaches the lungs. When the air is abnormally dry the membranes of the nose and throat are overworked in trying to supply the requisite amount of moisture. The result is chronic catarrh or some other diseased condition of the nasal and throat passages.

Everyone knows that adenoids and diseased tonsils affect the general health, bring about deformities of the face, give decreased lung capacity, and predispose to general weakness and even to tuberculosis. It is not so generally known, however, that diseased tonsils are intimately connected with rheumatism, heart disease and chorea (St. Vitus' dance). These four disorders are a quartet which often go together. Heart disease is one of the



Many children omit either breakfast or lunch. Of the 23,000 who answered the second list of questions, three per cent stated they were accustomed to do without breakfast; two per cent that they ordinarily ate no lunch. This would mean that approximately five per cent of the children in the city commonly eat but two meals a day.

Facts like those given above indicate the desirability of serving school lunches, also the need of domestic science instruction and enlightenment of parents. So important is it for the family to be provided with properly chosen and well cooked food that it is doubtful whether any subject in the schools ranks as more important for girls than domestic science. The nutrition of the school child of today can be improved by the frequent distribution to parents of simply worded instructions on children's food.

School lunches should be inaugurated in a number of schools as early as possible. In many they are imperative. Against school lunches the argument has been presented that the responsibility of the school board goes no farther than the education of the children; that it is the duty of the parents, and if the parents are not able, of charity or other departments of the city government, to furnish the food. Such an argument does little credit to those who present it. In other cities, throughout the civilized world, school boards have not hesitated to assume the responsibility of feeding hungry children. Why should the responsibility be shifted? The children are in school; they are too ill-nourished and lifeless to study; how can the state get the full returns for the cost of their instruction? Besides, in what other way than through the public school can all the children of all the people so easily be reached for the purposes of feeding or health supervision generally?

*Nervous and Exceptional Children.* According to the teachers' testimony, seven per cent of the children have one or more of the following traits: irritability, muscular twitchings, nervousness, excessive timidity, tendency to cry without cause, tendency to worry. Such children, as a rule, fall in the class usually described as "nervous." Many of them are bright, but they are prone to be sensitive, emotional or sometimes even "queer." Many children of this type are injured by the routine and discipline of the school. A few should be taken out of school entirely; others should be placed on a half-day schedule; but the large majority could have their condition improved by the right kind of medical supervision. The nervous conditions are often only a symptom of some physical defect, such as adenoids, crowded or aching teeth, eye-strain, mal-nutrition, etc.



Among other nervous conditions may be mentioned stuttering and stammering. Three per cent of the children in the schools are classified in this group. This is slightly larger than the proportion usually found. It is assumed, of course, that some children have been classified as stutterers whose speech defect was not extremely serious. As a rule, from 10 to 15 children out of 1,000 have a serious speech defect. Stuttering in the majority of cases can be cured by means of special classes in the schools. In certain countries of Europe this has long been the custom, and such schools are rapidly growing in favor in the United States. There are probably over 300 children in Denver who need such treatment. The common belief that stutterers nearly always recover spontaneously is not true. The majority do not recover, and so are burdened through life with a defect which acts as a serious handicap.

### **The Medical Examination of Teachers**

Before employment every candidate for a teaching position in the city should be given a thorough medical examination by some physician designated by the Board of Education. Simply to require a certificate from any "reputable physician" has no significance. Any candidate who hasn't both feet in the grave can find some physician willing to make the statement. Teachers in service should also be required, periodically and at any time on request, to submit to a re-examination.

The purpose of medical inspection of teachers is three-fold. In the first place, it is a safeguard to the health of thousands of children. A health resort like Denver must be eternally on guard against the tubercular or otherwise sickly teacher. A second purpose is for the economic protection of the city. When the city employs a teacher who is inefficient because of physical disability, there is economic waste. In the third place, such examinations are in the long run a benefit to the teachers themselves. As a result of the examination many teachers learn for the first time of the existence of some serious organic disorder which, taken in time, is easily cured, but if left undiscovered a little longer, might prove serious or fatal.

### **Open-Air Schools**

Denver is one of the very few cities of its size in the United States without an open-air school.\* Everywhere else their value is recognized, not only as a means of curing children who are

---

\*McKinley, Park Hill and Steele have, together, nine rooms of the open-window type. These are not open-air schools in the strict sense.

known to have tuberculosis, but still more as a means of improving conditions of those who are threatened with this dread disease. It would be foolish to suppose that Denver's need of open-air schools is less than that of other cities. While the climate is excellent, it must be borne in mind that for this very reason there is an unduly large proportion of the population who have sought the climate because of a predisposition to this disease.

It is agreed by prominent authorities that tuberculosis is a far more common disease among children than had formerly been supposed. It appears, indeed, that a majority of those who succumb to the disease in later or middle life have harbored it in their tissues from the years when they were children. Taking the country as a whole, approximately 12 per cent of the children who are not enrolled in the schools may be expected to die of tuberculosis, unless something is done for them. Denver's share would be something like 4,000. This alone is sufficient argument for the extension of school health work. The very least that could be done for the tuberculous or pre-tuberculous children would be to place them in open-air schools. There they would not only recover their health, but would at the same time make normal school progress.

### Hygiene Teaching

Many of the topics we have treated in connection with health supervision suggest the general trend which health instruction must take in order to be effective. Hygiene teaching will always be one of the most important aspects of school health work. It inculcates hygienic habits of living in the present generation of school children and lays the basis for a new order of hygiene for the next generation. The old-fashioned instruction in physiology of a decade ago had little effect upon habits of living. It is more important to give tooth brush drills in the schools than to teach the children the cellular structure of the layers of the teeth. Household hygiene, community hygiene, the rules of living in order to avoid ill health and disease—these are the important things for children to know.

### Playground Instruction

As shown in the report on school sites, Denver children have little encouragement to play, for the reason that adequate playgrounds are not afforded. Even those which are available are used far below their maximum capacity. The schools of Denver could well afford to give a greater amount of encouragement to helpful forms of physical exercise. For this purpose play and

games are infinitely superior to indoor exercises in the gymnasium. Indeed, in a climate like that of Denver the gymnasium can hardly be said to be necessary. Enlargement of playground wherever possible, and the employment of school playground instructors for afternoons, Saturdays and vacations, would be the cheapest form of health insurance that could possibly be supplied.

In this connection, school gardening may also be mentioned. This is not only of educative value, but tends to form the habit of outdoor exercise and has a beneficial influence generally on the health. In the modern city it is imperative for every kind of activity to be encouraged which tends to counteract the sedentary life of the pupils.



11.79  
1  
4  
4  
MAR 10 1919

**SUPPLEMENTAL REPORT**

ON THE

**ORGANIZATION  
*and* ADMINISTRATION**

OF

**School District Number One  
In the City and County of Denver**

---

**By ELLWOOD P. CUBBERLEY**

**Professor of Education**

**Leland Stanford Junior University**

---

**THE SCHOOL SURVEY COMMITTEE**

**Denver, Colorado**

**1916**

THE UNIVERSITY OF CHICAGO

LIBRARY

520 EAST 58TH STREET

CHICAGO, ILL.

1961

1961

1

1961

1961

1961

1961

1961

SUPPLEMENTAL REPORT

ON THE

ORGANIZATION  
*and* ADMINISTRATION

OF

School District Number One

In the City and County of Denver

---

By ELLWOOD P. CUBBERLEY

Professor of Education

Leland Stanford Junior University

---

THE SCHOOL SURVEY COMMITTEE

Denver, Colorado

1916





1.79  
1  
4  
4  
MAR 10 1919

**SUPPLEMENTAL REPORT**

ON THE

**ORGANIZATION  
*and* ADMINISTRATION**

OF

**School District Number One**

**In the City and County of Denver**

---

**By ELLWOOD P. CUBBERLEY**

**Professor of Education**

**Leland Stanford Junior University**

---

**THE SCHOOL SURVEY COMMITTEE**

**Denver, Colorado**

**1916**

... ..

...

...

...

...

...

...

...

...

...

SUPPLEMENTAL REPORT

ON THE

ORGANIZATION  
*and* ADMINISTRATION

OF

School District Number One  
In the City and County of Denver

---

By ELLWOOD P. CUBBERLEY

Professor of Education

Leland Stanford Junior University

---

THE SCHOOL SURVEY COMMITTEE

Denver, Colorado

=

1916

# REPORTS OF THE SURVEY

---

The report of the survey of the Denver situation is presented in five sections:

Part I. General Organization and Management.

By Franklin Bobbitt. 25c.

Supplementary Report.

By Ellwood P. Cubberly. 15c.

Part II. The Work of the Schools. 25c.

Elementary Schools. By Franklin Bobbitt.

High Schools. By Charles H. Judd.

Part III. The Industrial Survey.

By C. A. Prosser. 25c.

Part IV. The Business Management (Preliminary).

By F. S. Staley and J. T. Byrne. 15c.

The Business Management (Final).

By J. T. Byrne. 25c.

Part V. The Building Situation and Medical Inspection.

By Lewis M. Terman. 15c.

Copies of these reports may be had postpaid at the price named upon application to The School Survey Committee, Chamber of Commerce Bldg., Denver, Colorado.

CARLOS M. COLE,

R. E. WRIGHT,

Survey Committee.

MR. CARLOS M. COLE,  
MR. R. E. WRIGHT,

Survey Committee, Denver, Colorado.

Gentlemen:

As I understand the question which has been presented to me for an opinion, I have been asked to render to the people of the School District of the City and County of Denver, through your committee, a professional opinion on the general question of the proper form of organization and management for your system of schools. In particular I am asked for an opinion as to whether the form of organization and control recently adopted (January 12, 1916) by the Board of Directors for the City and County of Denver, conforms to good administrative principles in the matter of city school control, and whether or not such is an improvement over the form of organization previously in force. To that end I have had submitted to me, and have carefully examined, the following public documents bearing on the case:

1. Hand Books of the Denver Public Schools for 1910 and 1913, containing, in addition to the usual Directory, the Rules and Regulations (By-Laws) adopted by the Board of Directors for the management of the schools, and showing the old form of organization. Ninety-eight and one hundred one pages.

2. Hand Book of the Denver Public Schools for 1914-15, and containing, in addition to the usual Directory, selected regulations of the Board of Directors and the Board of Health relating to the work of the schools, and a classified list of all text books used in the schools of the city. Ninety-one pages.

3. Directory of the Denver Public Schools for 1915-16, with lists of text books used, all carefully classified under a number of headings. Sixty-two pages.

4. The Eleventh Annual Report of School District Number One in the City and County of Denver, and covering the operations of the schools for the school year 1913-14. Seventy-seven pages.

5. A comparison of the (new) By-Laws of School District Number One, City and County of Denver (adopted by the Board, January 12, 1916), and the Preliminary Report of the School Survey on Organization and Administration, with Appendices showing the By-Laws in full and the Summary of Recommendations. Twenty-four pages.

6. Report of the Survey Committee of School District Number One in the City and County of Denver; Part I, General Organization and Management, by Dr. Franklin Bobbitt. One hundred and sixteen pages.

These documents serve to set forth clearly the local problem, as they show both the past and the present forms for school control and, by contrast, the principles involved in the present controversy.

## METHOD TO BE FOLLOWED

The problem of proper school control for Denver, though, can not be considered merely as an isolated local problem. The same controversy has taken place in many other cities, and is but a natural manifestation of a historical evolution through which city school organization and management are passing. Doubtless there are a number of local and modifying conditions, but such exist in all cities, and after all do not materially affect the broad fundamental principles which we have come to feel underlie all efficient educational and business organization, and which are as applicable to one city as to another. It seems to the writer, therefore, that the quickest, and at the same time the easiest, method for dealing with the case at issue, will be to state first what has been the outcome of such controversies in other cities, and what we have finally come to recognize as sound principles underlying school control in cities, and then to examine both the old and the new forms of organization and management for the schools of Denver to see in how far each conforms to such generally recognized controlling principles. From such an examination the merits of the present controversy can be determined.

### I. EVOLUTION OF THE PRESENT PROBLEM

Schools everywhere with us arose largely as local undertakings, though almost everywhere under the express sanction or direction of the State. At first almost all matters relating to the conduct of the school were left to the people of the school districts to determine, and still later to their elected representatives. Gradually, however, the State, in the interest of a more efficient conduct of the schools, has been compelled to subtract power after power from the school district and the district representation, and to transfer such to educational authorities representing the county or the State. Within the past quarter of a century, and particularly during the past decade and a half, this tendency has become quite marked in educational legislation.



State constitutional provisions relating to public education have been lengthened and broadened, powers and duties formerly entrusted to district and county authorities have been transferred to authorities representing county and State, and a long series of State supreme court decisions have affirmed the principle that schools are primarily State institutions, created and maintained under the authority of the State that the future citizens of the State may be educated properly.

In consequence, cities, towns and school districts are now regarded as acting merely as agents of the State in carrying out the State purpose, and the powers with which they are entrusted may at any time be altered, expanded, or abridged by the State. In other words, schools have been established and are fostered by the State in the exercise of its fundamental right of preservation and improvement, and local school districts, be they large or small, act merely as agents for the State in the carrying out of a great State purpose.

## THE PURPOSE BACK OF GOOD ORGANIZATION

This great State purpose is the education of the future citizenship of the State, and in the best manner possible within the tax limits which the State feels that it can afford. It is to insure this education of the children in the best manner possible that all of the different forms of administrative organization for our schools have been created; aside from the carrying out of such a purpose they have no other meaning. Boards of directors, superintendents of schools, special supervisors, business officers, stenographers, clerks, janitors, and all other officials provided for by law or employed by boards of education, exist for the one main purpose of insuring that teachers and children may meet under such conditions as will be conducive to the best possible instruction of the children. It is for this, and for no other purpose, that all administrative boards and officers and forms of administrative control have been provided for by law or by local regulations.

## BEGINNINGS OF THE CITY PROBLEM

The little country school district, with its board of three school directors, we have had almost from the beginning of our national educational history, but city school organization is a much more recent development. Our first city school organizations did not begin until well into the first quarter of the nineteenth century, and the first city superintendent of schools dates from 1837. Many men are still living who obtained their little

schooling before city boards of education had become common, and before a city superintendent of schools had been provided for by any city in their State. Even as late as 1870 city school organizations did not differ essentially from village school organizations, and there were at that time but twenty-seven city superintendents of schools employed in all of the cities of the United States.

In twenty-four of the thirty-seven states forming the Union at that time, not one city superintendent of schools had as yet been employed. Everywhere, too, the few city superintendents of schools employed were but mere business clerks or secretaries for their boards of directors, and exercised but a very nominal supervision over either the teachers or the schools. City school organization and control, as distinct from rural or village organization and control, was in but its merest beginnings fifty or even forty years ago.

During the intervening period our city school systems have grown by leaps and bounds, and the problems in organization and administration which our city schools have had to face have been many and varied. Schools have been greatly increased in number and multiplied in type, new educational conceptions have come to dominate their work, new forms of educational work have been evolved, school systems have been extended greatly in scope, a profession of school supervision has been created, and some two thousand city superintendents of schools are now employed to assist in the direction of what has so recently evolved into one of our largest and most important public undertakings.

## OUR CITIES HAVE BEEN EXPERIMENTAL STATIONS

It is not too much to say that the great progress which we as a nation have made during the past half century, educationally, has been the progress in educational organization, administration, equipment, instruction, and the extension of educational advantages made by our city school systems.

As a consequence our cities have been centers of discussion and conflict, as well as laboratories for the trying out of many different forms for educational organization and control and for the inauguration of many new educational experiments. Almost every conceivable form of educational organization for administrative control has been tried, and is still being tried, and as a result a body of principles for proper school control has slowly been built up out of the experimentation and discussion and conflicts which have taken place. A number of matters of detail are as

yet undecided, but the broad outlines of proper city school administrative organization may now be regarded as settled. In some states and cities these principles have been incorporated into the general school law of the State or into special city charters, but in many their adoption has been left optional with boards of school directors, large powers of initiative being left to such under the general power to adopt by-laws (rules and regulations) for the government of the schools.

## II. FUNDAMENTAL PRINCIPLES INVOLVED

Having traced this discussion and evolution, and having stated the resulting principles, in some detail, in a volume now used as a text book in school administration\*, the writer may be permitted here to summarize, in a series of brief statements, the results of this half century of discussion and experimentation, reserving any extended discussion of each until the old and the new By-Laws of the Board of School Directors for the City and County of Denver are taken up for examination.

### *I. General Controlling Principles.*

1. Schools have been ordered established by the constitution and the laws of the State for the protection and advancement of the welfare of the State, through the education of the future citizens of the State.

2. Every future citizen (child) is entitled to the best education for future citizenship which the State or its agents (political subdivisions) can afford to provide.

3. Only the best possible education within the means of the State should be provided, and this can be only when the system of organization and management is that best calculated to secure the most efficient results, and when all executive heads, supervisors and teachers are the best it is possible to obtain with the money which is available.

4. Schools exist, in no sense, to afford places or patronage for anyone. To use the schools in any way for local charitable, political, social or religious purposes, prostitutes public education to inferior ends. No one is entitled by right to any position within the school department except on the basis of being the best prepared and the most professionally-in-earnest person available.

5. The separation of the school department from the city patronage departments is important, and the erection of the city

---

\*Public School Administration. A statement of the fundamental principles underlying the organization and administration of public education. 479 pages. 36 drawings. Houghton, Mifflin Co., Boston.

school district as a legal corporation separate and distinct from the municipality, even though the boundaries of the two be one the same, is very desirable. The school district is essentially a State corporation, erected by the State to carry out a State purpose, and is coordinate with the home and the church as a great social institution rather than with the municipality. As such it should work under State laws, and not under municipal ordinances, and should be allowed, within limits fixed by the State, to determine and order levied the taxes needed to maintain its schools.

## *II. Boards for School Control.*

1. To represent the State, and the people of each school district who collectively constitute the State, city boards for school control (directors)\* are needed. These should be small in number (preferably five), elected by the people from the city at large and for relatively long terms (five years, if a board of five), and the memberships should change slowly (one each year, if a board of five). The right of recall should be guaranteed to the people in case any member of the board of control proves incompetent, or comes to be actuated by other motives than serving the best interests of the schools. No pay should be given for membership or attendance at board meetings, as the positions should be regarded as public honors, and should provide an opportunity for large public service to certain types of interested citizens. The man who is looking for a paying job has no business on a board for school control.

2. A board for school control for a city school district should be distinctively a business board, closely analagous to a board of directors for a business corporation. The board should meet as a body around a single table, with its executive officer or officers, and should transact the business of the department quietly and expeditiously. Standing committees and speeches are as much out of order in the conduct of the business of a school department as in the conduct of the affairs of a bank or a store.

3. The prime purpose of a board for city school control today is to serve the people of the city, and through them the State, as a board of directors would serve the stockholders of a business corporation. For the City and County of Denver the school corporation has approximately a quarter of a million stockholders, fifty thousand of whom (the children) are expecting dividends

---

\*The term "board for school control" is much better than such terms as "board of school directors" or "board of education," as it accurately describes the proper functions of such a board. The prime function of such a board is to control policies, approve new undertakings, and determine expenditures and expansions, and not to direct the work of the schools or to supervise the education therein.

from their board of directors. The Denver school board also controls some seven millions of dollars' worth of property, employs some twelve hundred employes, and directs an expenditure of over one and a half millions of dollars each year. The satisfactory conduct of so large a business undertaking calls for a high degree of expert knowledge, and for a large centralization of authority and responsibility.

4. The direction of the educational affairs of any large city has today become so important and so technical, and now involves such a degree of expert knowledge and nicety of adjustment if the best results are to be obtained, that no board of laymen, however worthy or willing, is any longer competent to handle the details of the work of school organization and administration. These should be turned over to competent officers, and the board should confine its attention to the larger features of the administrative problem.

5. These larger features relate, first and most important, to the selection, from time to time, of the executive officer or officers upon whom the board is to depend for advice, and for the execution of its policies; to the determination, after listening to the recommendations and the advice of its executive officers, of the educational and business policies for the school system; the selection of school sites, and the approval of proposals for alterations and new constructions; the consideration of recommendations for the expansion of the school system; the adoption of salary schedules, the approval of new expenditures, and the determination of the annual budget and tax levy; the inspection of the results obtained by their executive officers in the management of the business; presentation to the people, through the medium of an annual report, of the needs of the school system; and the prevention of unwise legislation relating to the schools by either the city or the legislature.

6. Proper city school organization and management call for a clear separation of the work of school control into legislative, executive, and inspectional functions. All sound theory, and the results of both business and educational administrative experience, call for a clear separation of legislative and executive functions. It is the prime business of the board of school control to hear reports, to listen to the advice of its executive officers, and then to legislate; it is the prime business of the executive officers to execute the legislation enacted, and to report the results to the board; and it is the function of the board in turn to judge the results of its policies and the work of its executive officers by inspecting the results obtained.



### *III. The Educational Department.*

1. Since the schools exist primarily for the education of children, the central executive department naturally is the educational, the head of which is the Superintendent of Schools. He corresponds to the superintendent or general manager of a telephone company, electric power company, department store, factory, or any other form of business corporation, and good operating results demand that he be made the executive and coordinating head of the entire school system, responsible in turn to the board for results. While he will naturally give to the different heads of departments under him large liberty of action in matters under their control, it is important that he be given a coordinating oversight and direction of their work. Especially is this true with reference to the business, supply and building departments, which are often set off under executives independent of the Superintendent of Schools, and usually with results disastrous to the educational work of the schools. If the superintendent possessed of such authority cannot get results he should be replaced by someone who can, but he can not properly be held for results where he is not first given administrative control. Power and responsibility must go together.

2. In all matters of a strictly educational nature, such as the approval of courses of study, the selection of text books, the classification of pupils, and the nomination for appointment, assignment, promotion, or dismissal of teachers, principals and supervisors, the initiative should rest wholly with the superintendent of schools. The board should determine the number of positions to be filled, and the compensation to attach to each, and should have the right to disapprove of the recommendations of the superintendent, but not to make any substitution of its own. All such matters involve a degree of professional knowledge which no board of laymen can possess, and their right to exercise such is slowly but gradually being taken from them by law.

3. The Superintendent of Schools, as the general manager of the business, should be guaranteed the right to be present at all meetings of the Board of Directors, and all regular or special committees of the same, with the right to speak on any question before the Board, but with no right to vote.

4. From time to time the Superintendent of Schools will be expected to report the results of expenditures and operations to the Board of Directors, and through them to the people of the city, that both Board and people may have a proper basis for inspecting the results being obtained in the schools, and from such inspection estimate the efficiency or inefficiency of the superintendent and his assistants.

## THE SURVEY RECOMMENDATIONS AND THESE PRINCIPLES

A careful examination of Part I of the Report of the School Survey, dealing with General Organization and Management, shows that the recommendations of Dr. Bobbitt are in complete harmony with the above statement of general controlling principles, derived from a half century of experience. The comparison of the principles of good management between a manufacturing corporation and a school corporation, each employing 1,200 people, given on pages 111-116 of Dr. Bobbitt's report, is especially sound. The general controlling principles stated in Part I of the Report of the School Survey are in harmony with our best administrative practice, and the results of school surveys so far made, and would be approved, it is felt, by students of educational administration everywhere.

With these controlling principles as a guide we shall now pass to an examination of the administrative organization of the Denver school district, to see in how far both the old and the new rules conform to what we may assert have now come to be recognized by students of school administration and legislators as sound principles in educational administrative procedure.

### *IV. The Old By-Laws.*

The diagram printed opposite page 12 shows the form of administrative organization in force in 1913, as contained in the rules and regulations for the government of the schools contained in the Hand Book bearing that date. It is a rather typical example of the earlier form of school board organization, and a majority of our large cities still follow such a plan.



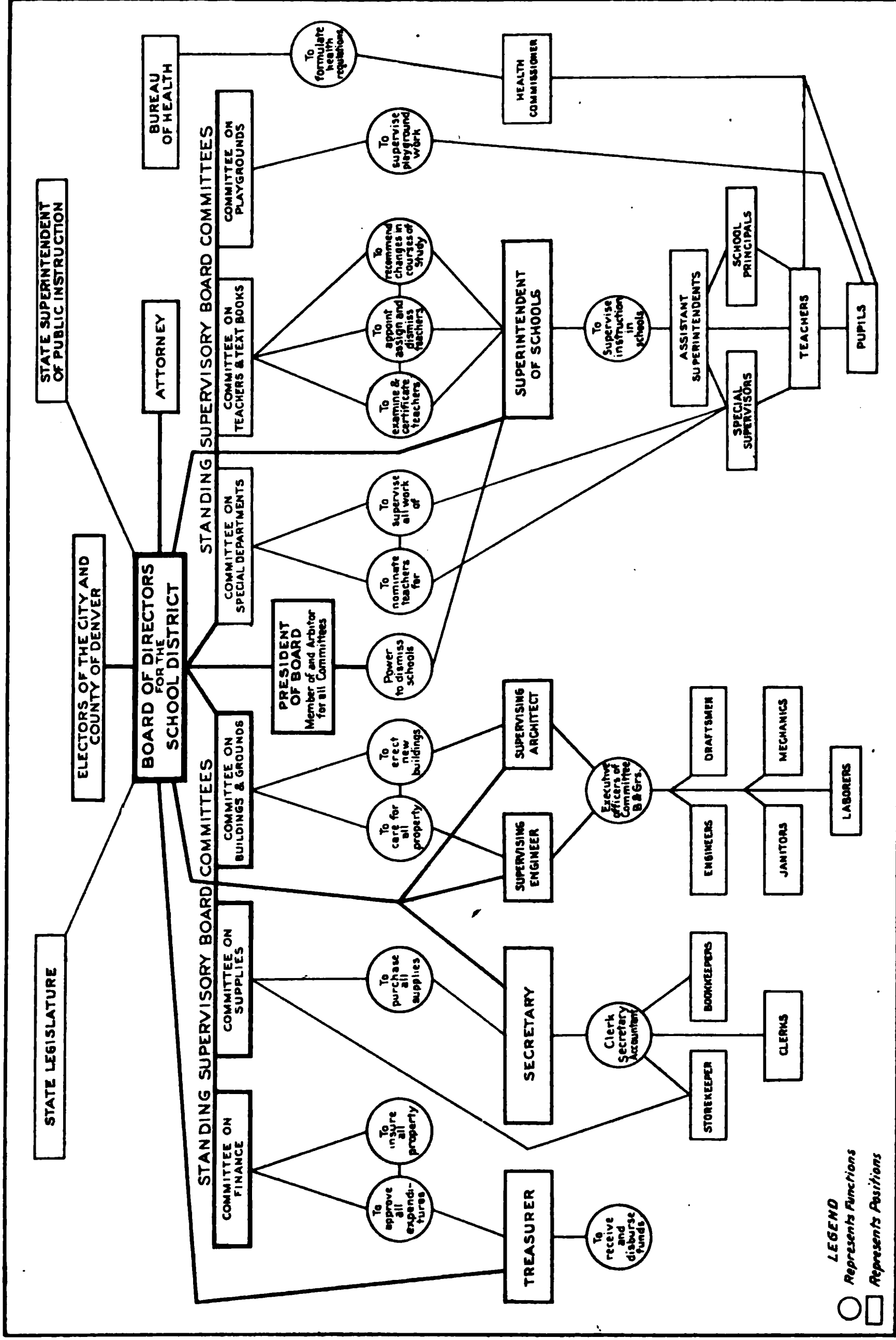
## WHAT THE DIAGRAM REVEALS

A careful examination of the diagram will reveal, however, how seriously such a form of organization is in conflict with all principles of good business and educational management. One of the most obvious features of such a form of organization is that the board of directors for the school district and the different committees of the board are altogether too prominent in the administration of the schools, and that the executive officers employed by the board have altogether too little authority, and occupy entirely too much the position of clerks and servants to the different board committees. The six supervisory standing board committees are virtually half a dozen different school boards, each working more or less independently at parts of the educational problem, each exercising both legislative and executive functions, and each attempting many things which it is not only foolish for a changing lay board to attempt, but things which lay boards cannot possibly be very competent to handle. Only the committee on finance has functions assigned to it which are proper for committee or school board control, while the extreme in the other direction is reached in the committee on teachers and text books and the committee on special departments, both of which attempt to exercise functions which no board of laymen, however interested or willing, ought ever attempt to handle.

The inevitable result of any such attempt at school board or school committee control is educational mismanagement, economic waste, and the defrauding of the children of the city out of their right to the best education possible with the money at hand. Especially in the selection, promotion and dismissal of teachers, the point where school board or committee mismanagement is fraught with the most disastrous results, is such mismanagement most likely to occur and the interests of the children most likely to suffer.

## PROFESSIONAL FUNCTIONS SHOULD REST WITH PROFESSIONAL EXPERTS

All such functions as the selection of text books, the outlining of courses of instruction, the direction of special departments, the examination and certification of teachers, the nomination of teachers for appointment, promotion, or dismissal, and the selection of principals for positions, have today become highly professional functions. In all such the initiative should rest solely with the superintendent of instruction, and school boards should be deprived by law of any right of initiative. The purchase of



**DIAGRAM NO. 1**



school supplies, the approval of plans for the erection, alteration and repair of school buildings, the control of playgrounds, and the supervision of the work of engineers and janitors, also have important relationship to the work of instruction, and should at least be under the partial direction of the Superintendent of Schools.

### A DECENTRALIZED CONTROL

The diagram showing the old form of organization also reveals the lack of any centralized control over the entire business, a condition almost certain to result in conflicts between the different executive officers, and in a lack of efficiency and directness in the administration. The schools exist for educational ends only, and the natural head for the entire administrative organization is the Superintendent of Schools. The old form of educational organization certainly did not insure any such administrative centralization, but instead provided for a number of largely independent executive officers, each under the direction of some one or more school-board committees, with the board of school directors as the inter-communicating and arbitrating body.

### SCHOOL AND HOSPITAL CONTROL

The weakness of the old form of organization may be understood easier and better if we imagine the board of school directors to have been elected, not to manage the schools, but instead to manage a large municipal hospital which the city of Denver had decided to provide for its people, and that the board then divided the work up among analogous committees and proceeded to run the hospital in the same way the schools have been run in the past.

We would then have the following situation :

School Board Committee	Analogous Hospital Committee	Chief Duties of Committee
1. Finance . . . . .	Finance . . . . .	To approve all expenditures, and to insure property.
2. Buildings and Grounds . . . . .	Buildings and Grounds . . . . .	Control of hospital property approval of plans for altering building or erecting new wings.
3. Supplies . . . . .	Supplies . . . . .	To purchase all drugs, instruments, and hospital supplies needed.
4. Teachers and Text Books . . . . .	Nurses, Doctors and Medical Treatments . . . . .	To examine, certificate, appoint, and dismiss all regular nurses and doctors; to approve all lines of medical or surgical treatments.

School Board Committee	Analogous Hospital Committee	Chief Duties of Committee
5. Special Departments.....	Special Wards...	To examine, certificate, appoint, and dismiss all specialists for the special wards, such as maternity ward, contagious disease ward, etc., and direct the treatments.
6. Playgrounds . . . . .	Children's Ward.	Same as above for the children's ward.

The proposal for such a form of hospital control seems absurd, yet if school board members are competent to direct schools because they have once been in school and have children in school, they are similarly competent to direct a hospital because all have at some time been sick and have seen and cared for sick people.

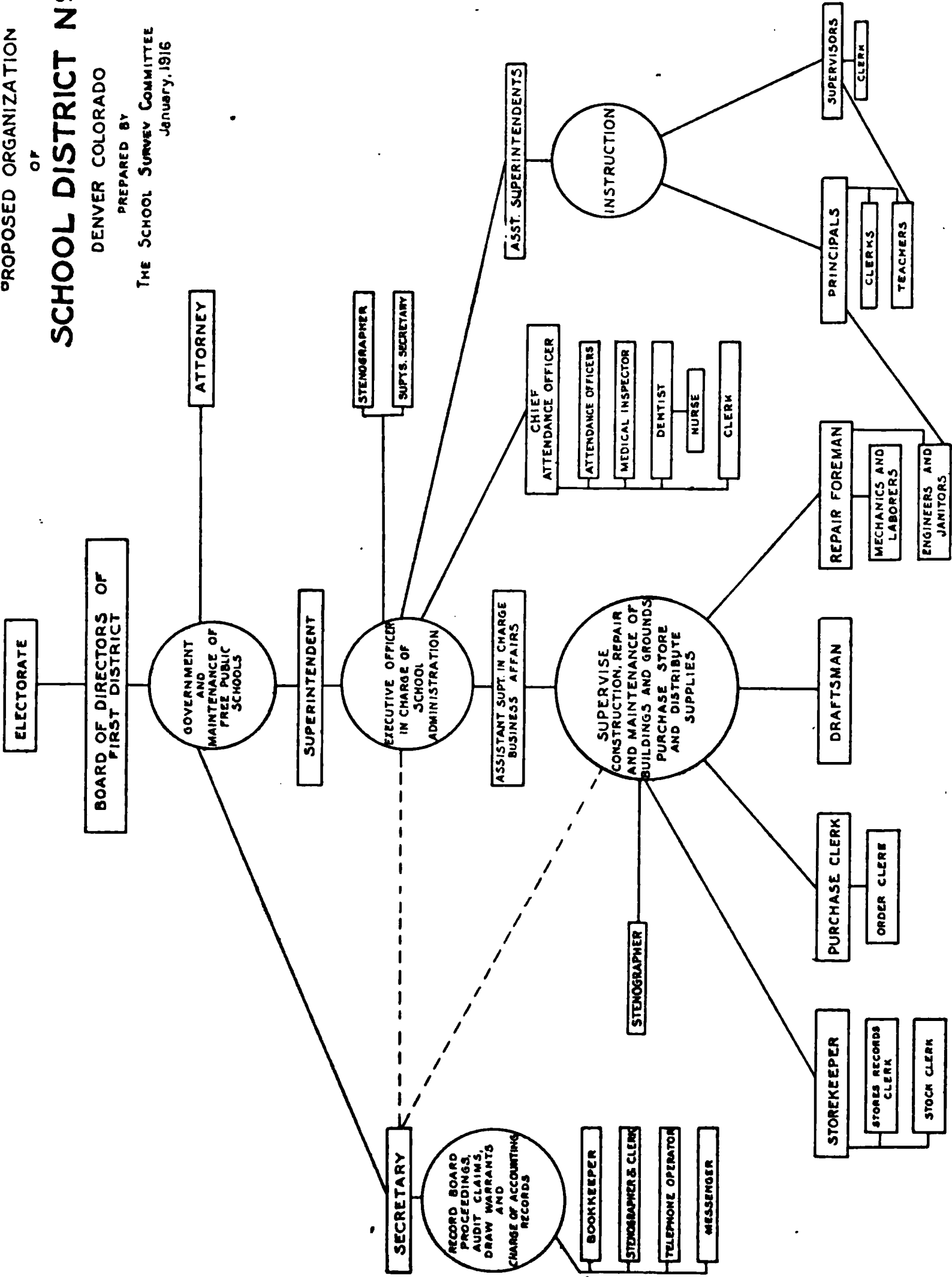
### ANALOGOUS ADMINISTRATIVE CONTROL

Imagine, still further, that the superintendent of the hospital is now confined solely to the supervision of operations and treatments, with control over only such nurses and doctors as the board of Directors sees fit to appoint, and no control over the heating and lighting, the janitor service, the kitchen and food service, and the supplies furnished. The increase in the municipal death-rate resulting from such poor administrative organization can easily be imagined. That the citizens would soon replace the hospital board by one pledged to institute a better form of hospital management can hardly be questioned, yet the mismanagement which takes place in many city school systems today is not less than that which would take place in a municipal hospital so organized and conducted. The difference is that the people have as yet few standards by means of which they can judge that educational mismanagement is actually taking place.

### ANALOGY TO BUSINESS MANAGEMENT

The same principles apply to the management of any large business undertaking, such as a telephone company, a department store, or a manufacturing establishment. No person of any business judgment would invest a dollar of his savings in any business undertaking which was conducted along the lines of such a dangerous form of administrative organization as is shown in Diagram No. 1. Sooner or later any business, dependent upon earnings and organized on such a plan, would inevitably go to the wall. The centralization of authority in the hands of the one man deemed most competent to manage the business which the directors can employ, is the secret of all business suc-

CHART OF  
PROPOSED ORGANIZATION  
OF  
SCHOOL DISTRICT No 1  
DENVER COLORADO  
PREPARED BY  
THE SCHOOL SURVEY COMMITTEE  
January, 1916



LEGEND  
O Represents Functions  
□ Positions

DIAGRAM NO. 2





cess, and schools conducted on other than good business lines can not be very successful institutions. The schools can not, of course, completely fail, as a business dependent upon earnings would, simply because schools are a state monopoly supported by the taxing power, but schools organized and conducted in defiance of good principles of administrative organization will earn but very small dividends for the preferred stockholders (the children) and almost nothing at all for the common stockholders (the citizens of the city) who maintain them. The only ones who are likely to profit by such bad organization are the directors of the undertaking, who often experience a certain amount of satisfaction in running the business and in giving orders to the executive officers, and who sometimes use their positions to build up a personal following and influence by favoring friends for contracts and for positions on the teaching or janitorial staff.

### THE OLD FORM OF ORGANIZATION SERIOUSLY DEFECTIVE

The old form of school organization, as set forth in the Hand Book for 1913, and as shown in Diagram No. 1, must be regarded as having been seriously defective in that it was not in harmony with good business procedure, the best of our educational administrative experience, the controlling principles previously set forth in this report, or with the recommendations of Part I of the School Survey, which recommendations the writer of this report regards as thoroughly sound and in harmony with the best of our theory and practice. Under the 1913 form of school organization educational progress would inevitably be slow, authority to remedy bad conditions would often be lacking, responsibility almost impossible to fix, and the large independence of committees and executive officers would almost inevitably produce an inefficient type of administrative organization.

#### *V. The New By-Laws.*

On January 12, 1916, the Board of Directors for the City and County of Denver school district adopted a new series of rules and regulations (by-laws) for the government of the schools of the district, and which established in Denver a form of educational organization believed to be in harmony with good principles in business and educational organization. This new form of organization is shown in Diagram No. 2, printed opposite.

## IMPORTANT CHANGES EFFECTED

An examination of this second diagram, in comparison with Diagram No. 1, will show the changes and the centralization of authority which have been effected by the new by-laws. Board committees and the resulting committee control of executive functions have been entirely abandoned. The board now acts, as a body, on such important matters as a school board ought to handle, and turns executive details over to its executive officers to handle. The Superintendent of Schools has been made what he should be, the executive head of the entire educational business. Only the secretary of the board stands out to one side as yet largely independent. This is perhaps proper under the circumstances, as his duties are essentially those of a recording clerk, but even with the secretary there will be times when the superintendent should have coordinating control.

The dominating characteristics of the new rules are the centralization of authority in the hands of an executive officer who may be held responsible for results, and a great simplification of business and educational procedure. The vast amount of energy which the board formerly spent on administrative details is now saved for the larger and more important, and usually neglected problems, connected with school control.

## THE SUPERINTENDENT OF BUSINESS

The provision of an Assistant Superintendent for Business Affairs, under the direction of the Superintendent of Schools and responsible to him and through him to the board and the people for the proper direction of business and school-building control, is an admirable feature of the new form of organization. It cannot be emphasized too strongly that business administration in a school department is an educational more than a business matter, and should be handled from the educational point of view. What is wanted for such a position is an educational man with business sense. Many of the most serious cases of business maladministration in our larger cities have arisen from the work of a business man, possessed of no educational sense, in charge of the business department and independent of any control by the Superintendent of Schools.

## CONCLUSIONS AS TO THE NEW BY-LAWS

A careful examination of the by-laws adopted by the Board of Directors on January 12, 1916, has convinced the writer that they are thoroughly sound in principle, that they are founded on

the best of business and educational administrative experience, that they provide for one responsible executive head for the entire school system, that they give such executive head authority commensurate with the responsibility he is expected to carry, and that they provide for a proper division of the legislative and executive functions between the board on the one hand and the executive head and his subordinates on the other. Viewed in the light of the fundamental controlling principles laid down in the first portion of this report, and so well stated in Part I of the Report of the School Survey, and viewed also in the light of the by-laws in force in other cities of the United States, it is the opinion of the writer that the new by-laws of the Board of Directors for the Denver City and County school district should rank as among the most intelligently conceived and administratively sound series of by-laws now in force in any of our American cities, and as such ought to be continued in force without any material change. The Board of School Directors are to be highly commended for their foresight and the large public service they have rendered by the adoption of such a progressive form of organization and administration for the Denver schools.

### WHAT THE BY-LAWS PREVENT

This, perhaps, is the chief trouble with the new by-laws. Our people generally are used to village and district-meeting methods in the conduct of the schools, and not to a responsible centralization and good business organization. School directors usually feel that they are elected to direct details, instead of to approve or disapprove of broad policies. People who have things to sell often don't want an intelligent and careful purchasing agent, who buys only what is needed, and at the best prices obtainable. Building contractors don't care for a constant and efficient supervision of the buildings they are erecting. Most of all, however, comes opposition from the man who wants to use the schools for purposes of friendship or patronage, and feels that one of his privileges of citizenship has been taken from him when he is deprived of the ability to foist his friends, or his friend's friends, onto the public payroll as teachers or as janitors. The chance to use the administration of the schools to build up a following or a machine to lead to further political preferment, or to increase one's business, seems to certain types of men too good to permit such to be turned over to one competent and responsible executive head. It puts the educational service on a basis of efficiency instead of one of influence, and for that reason is not especially acceptable to a certain type of citizen.

## THE PEOPLE AND CERTAIN POPULAR OBJECTIONS

The great majority of the people of our cities, though, are not influenced by any of these lower considerations. They desire good schools for their children, but don't know how to get them, and are easily led astray by someone who does not understand or does not want to understand that centralization of authority and responsibility are now necessary to insure good schools. The cry that the plan is "revolutionary," that it turns the management of the local schools over to an "outsider," that it is "too great a centralization of power in the hands of one man," or that it is "undemocratic," alarms people before they understand its merits, and they tend to vote down the plan before it has had a chance to demonstrate its advantages.

## THE PLAN NOT REVOLUTIONARY

The new plan adopted for the organization and administration of the schools of Denver is in no way "revolutionary," but rather evolutionary; it follows the best lines of evolution in city school control, as previously adopted by a number of our more progressive cities; and it is one which ultimately must be adopted by or imposed by general state law on all. The administration of city school systems has today become too complex, too detailed, too intricate, and too highly expert a piece of work to be much longer left to be managed by the village methods adapted to the needs of the very simple and undifferentiated school system of a half century ago. City schools today are a big and a costly business undertaking, calling for expert knowledge of a high order, and the type of educational results which intelligent parents now demand for their children cannot be obtained under the decentralized forms of organization and the inexpert lay control which have so markedly characterized educational administration up to very recently.

## A SUPERINTENDENT NOT AN OUTSIDER

Neither is the Superintendent of Schools an "outsider," once he enters the services of the city. As was emphasized in the beginning, schools can in no sense be regarded as a local industry, but are a State—almost one might say a National—undertaking, the purpose of which is the education of the future citizen so as to advance the welfare of the State and Nation. School supervision represents not only a new profession, but one of the most important professions we have ever evolved. The

executive superintendent is fast becoming a national rather than a local character, owing allegiance to the Nation's service rather than to the smaller interests of any town or city. His heart is where he works, and he renders service accordingly.

Usually the superintendents who do most for the schools are the so-called outsiders; in addition to wider experience they bring to the service of the city a new and larger point of view. It makes no difference at all where a superintendent comes from, so long as he serves the children of a city well, and once he serves them he becomes one of the community. All objections on the "outsider" basis arise from a local-patronage conception of public education which we ought to rid ourselves of at once.

### NOT TOO GREAT A CENTRALIZATION OF AUTHORITY

The objection that the plan is "too great a concentration of authority in the hands of one man" usually arises from ignorance of proper administrative procedure, but sometimes arises from ulterior motives. It can not be made too clear that responsibility for results must be accompanied by authority to secure them. Under the new by-laws one man—the Superintendent of Schools—becomes the person responsible for the honest and successful administration of the schools; under the old by-laws no one was responsible for scarcely anything. If there is graft now in a building contract, if the building erected falls short of the specifications, if the supplies furnished the schools are poor in quality or unsuited to the school work, if the course of study is defective, if poor teachers are employed or retained, if the instruction is poor in quality, if incompetent executives are promoted to or retained in important executive positions, or if any one of a dozen other things takes place, it is possible for the board or the citizen to put a finger on the one man responsible for such a condition and to hold him to strict accountability for his work; under the 1913 form of organization it would be almost impossible to hold anyone responsible for anything.

Centralization of authority means responsibility for results; diffusion of authority means the diffusion of responsibility as well. Every lesson from the business world is a lesson in the value of the centralization of authority, and the consequent holding of someone for results. Under the new by-laws the weak executive will be speedily weeded out; under the old he could hang on for a long time.

## THE PLAN NOT UNDEMOCRATIC

Neither is the plan "undemocratic." If it is, we need to get a new conception of democracy as speedily as possible. Democracy ought to mean the greatest good for the greatest number, and should not of necessity involve that many persons should work at any one problem. In the case of the schools the greatest good of the children in the schools is the whole point at issue. This demands efficient organization and intelligent control. All business and educational administrative experience shows that such can best be promoted by the employment of experts, and the centralization of the responsibility for good results in the hands of one responsible person. The future and safety of democracy demands that we train leaders for the people's service, and train the people to follow trained leaders. The work of democracy is not for all to try to lead, but rather for the bulk of our people to follow their leaders, and to inspect and check up in turn the results their leaders attain.

The people as a mass cannot either select the leaders or check up the results of their work in any efficient or effective manner. Representatives are in consequence selected to represent the people, and to see that the experts selected to serve the people get reasonably satisfactory results for the money expended. The representatives of the people legislate as they think the interests of the people demand; the selected experts employed then apply a high degree of professional skill in an effort to secure the best possible results along the lines the people desire, and report results; the representatives of the people then inspect the results obtained and report back to the people, through the medium of a printed report, thus giving an account of their stewardship.

This is real government by and for the people, and rapid progress in the interests of democracy is possible under such a form of administrative organization. On the other hand, the form of organization where every citizen must first be heard in meeting, and every representative of the people must have his full share in the government, is democracy gone to seed, and is one of the most autocratic forms of government possible because it is the rule of mediocrity without responsibility for results.



## GENERAL CONCLUSIONS

My conclusion, then, is that the new by-laws, adopted by the Board of Directors for the Denver City and County School District on January 12, 1916, are thoroughly sound in principle, and should be retained by your city; that these new by-laws represent a very marked advance in the possible effectiveness of school administration in your city; that the old (1913) by-laws, under which the schools were conducted for so many years, were based on wrong administrative principles, and that the best educational results were not possible under them; and finally that the principles relating to the general organization and management of your schools, as set forth in Part I of the School Survey, by Dr. Bobbitt, are in conformity with our best administrative experience and theory, and that the report is an able presentation of the fundamental administrative principles involved in proper city school control.

It is my belief that if your schools are once permitted to settle down from their present condition, and to continue for half a dozen years under the wise educational leadership, the people of Denver half a dozen years from now could never be induced to return to any form of educational organization such as is set forth in the by-laws of 1913.

Respectfully submitted,

ELLWOOD P. CUBBERLEY.

APR 2 1916



W. (1915-1916)



